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1922/23

# *The Bulletin of the University of Minnesota*

*The College of Agriculture, Forestry,  
and Home Economics*

*Announcement of Courses for the Year  
1922-1923*



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Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
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9	10	11	12	13	14	<b>15</b>	9	10	11	12	13	14	15	15	16	17	18	19	20	21
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13	14	15	16	17	18	19	14	15	16	17	18	19	20	12	13	14	15	16	17	18
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11	12	13	14	15	16	17	11	12	<b>13</b>	14	15	16	17	10	11	12	13	14	15	16
18	19	20	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	18	19	<b>20</b>	21	22	23	24	17	18	19	20	21	22	23
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# UNIVERSITY CALENDAR

1922-23

1922			
September	16	Saturday	Payment of fees closes, except for new students
September	19-26		Examinations for removal of conditions and entrance examinations Physical examinations for all new students
September	19-23		Registration period, new students
September	26	Tuesday	Payment of fees for new students closes
September	27	Wednesday	Fall quarter begins, 8:15* a.m.
October	2	Monday	School of Agriculture, first term begins
October	14	Saturday	Class Scrap Day; classes dismissed the third and fourth hours
October	26	Thursday	Senate meeting, 4:30 p.m.
October	27	Friday	Last day for removal of spring quarter incompletes
November	4	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	7	Tuesday	General Election Day; a holiday
November	11	Saturday	Armistice Day; a holiday
November	13	Monday	Advanced Creamery Operators' Short Course begins
November	25	Saturday	Advanced Creamery Operators' Short Course closes
November	27	Monday	Ice Cream Operators' Short Course begins
November	30	Thursday	Thanksgiving Day; a holiday
December	2	Saturday	Ice Cream Operators' Short Course closes
December	4	Monday	Milk Plant Operators' Short Course begins
December	9	Saturday	Milk Plant Operators' Short Course closes
December	14	Thursday	Senate meeting, 4:30 p.m.
December	20	Wednesday	Last day for registration except for new students Fall quarter ends, Christmas vacation begins, 5:20 p.m. School of Agriculture, first term closes
1923			
December	26	}	Registration for new students
January	2		
January	2	Tuesday	Creamery Operators' Short Course begins



January	2-6		Farmers' and Home-Makers' Week Short Course
			Power Farming Short Course
January	4	Thursday	Christmas vacation ends, winter quarter begins, 8:15* a.m.
January	8	Monday	School of Agriculture, second term begins
February	5	Monday	Last day for removal of fall quarter incompletes and conditions
			Horticultural Short Course begins
February	10	Saturday	Creamery Operators' Short Course closes
February	12	Monday	Lincoln's Birthday; a holiday
February	13	Tuesday	Cheese Plant Operators' Short Course begins
February	15	Thursday	Senate meeting, 4:30 p.m.
February	22	Thursday	Washington's Birthday; a holiday
February	24	Saturday	Horticultural Short Course closes
March	10	Saturday	Cheese Plant Operators' Short Course closes
March	23	Friday	Last day for spring quarter registration except for new students
			Winter quarter ends, spring vacation be- gins, 5:20 p.m.
March	28	Wednesday	School of Agriculture, second term closes
April	2-6		Boys' and Girls' Week Short Course
April	4	Wednesday	Spring vacation ends, spring quarter be- gins, 8:15* a.m.
April	18	Wednesday	Home Nursing Short Course begins
May	3-5		Editors' Short Course
May	4	Friday	Last day for removal of winter quarter incompletes and conditions
May	15-18		Beekeepers' Short Course
May	17	Thursday	Senate meeting, 4:30 p.m.
May	23	Wednesday	Home Nursing Short Course closes
May	30	Wednesday	Memorial Day; a holiday
June	17	Sunday	Baccalaureate service
June	20	Wednesday	Fifty-first annual commencement
June	20	Wednesday	Spring quarter closes, 5:20 p.m.
June	23-25		Registration days for Summer Session
June	26	Tuesday	Summer Session and summer quarter begin
July	4	Wednesday	Independence Day; a holiday
August	3	Friday	Summer Session closes
September	7	Friday	Summer quarter closes

\* First hour classes begin at 8:30 on the Minneapolis campus.

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<sup>1</sup> Died April 3, 1922.

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<sup>1</sup> Leave of absence, 1922-23.

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 JAMES DAVIES, Ph.D., Assistant Professor of German  
 HAL DOWNEY, Ph.D., Professor of Histology  
 GEORGE W. DOWRIE, Ph.D., Professor of Economics  
 ELIAS J. DURAND, D.Sc., Professor of Botany  
 RICHARD M. ELLIOTT, Ph.D., Associate Professor of Psychology  
 MANUEL C. ELMER, Ph.D., Associate Professor of Sociology  
 WILLIAM H. EMMONS, Ph.D., Professor of Geology  
 HENRY A. ERIKSON, Ph.D., Professor of Physics  
 DONALD N. FERGUSON, B.A., Assistant Professor of Pianoforte  
 ROSS L. FINNEY, Ph.D., Assistant Professor of Educational Sociology  
 WILLIAM S. FOSTER, Ph.D., Associate Professor of Psychology

<sup>1</sup> Absent on leave, 1922-23.

<sup>2</sup> Absent on leave, fall and winter quarters.

- JULES T. FRELIN, B.A., Assistant Professor of Romance Languages  
 FREDERIC B. GARVER, Ph.D., Professor of Economics  
 CHARLES C. GAULT, M.A., M.B., Assistant Professor of Physiology  
 ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry  
 JOSEPH E. GILLET, Ph.D., Professor of Romance Languages  
 RODNEY B. HARVEY, Ph.D., Associate Professor of Plant Pathology and Botany  
 ERNEST A. HEILMAN, Ph.D., Assistant Professor of Accounting  
 ARTHUR T. HENRICI, M.D., Associate Professor of Bacteriology  
 NED L. HUFF, M.A., Assistant Professor of Botany  
 WILLIAM H. HUNTER, Ph.D., Professor of Chemistry  
 ALBERT E. JENKS, Ph.D., Professor of Anthropology and Director of Americanization Training Course  
 FRANCIS B. KINGSBURY, Ph.D., Associate Professor of Physiologic Chemistry  
 LEE I. KNIGHT, Ph.D., Professor of Botany  
 WINFORD P. LARSON, M.D., Professor of Bacteriology and Immunology  
 KARL S. LASHLEY, Ph.D., Associate Professor of Psychology  
 IRVILLE C. Lecompte, Ph.D., Professor of Romance Languages  
 ELMER J. LUND, Ph.D., Associate Professor of Zoology  
 GUSTAV A. LUNDQUIST, M.A., Assistant Professor of Rural Sociology  
 ELIAS P. LYON, Ph.D., M.D., Professor of Physiology  
 JESSE F. McCLENDON, Ph.D., Professor of Physiology  
 FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry  
 LOUALLEN F. MILLER, M.A., Assistant Professor of Physics  
 WILFORD S. MILLER, Ph.D., Professor of Educational Psychology  
 CECIL A. MOORE, Ph.D., Associate Professor of English  
 BRUCE D. MUDGETT, B.A., Associate Professor of Economics  
 HENRY F. NACHTRIEB, B.S., Professor of Animal Biology  
 MARVIN G. NEALE, Ph.D., Professor of Educational Administration and Supervision  
 HOWARD S. NOBLE, M.B.A., Assistant Professor of Accounting  
 OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology  
 EVERETT W. OLMSTED, Ph.D., Litt.D., Professor of Romance Languages  
 DONALD G. PATERSON, M.A., Associate Professor of Psychology  
 CHAUNCEY J. V. PETTIBONE, Ph.D., Associate Professor of Physiologic Chemistry  
 RUTH S. PHELPS, M.A., Associate Professor of Romance Languages  
 RUTH RAYMOND, Assistant Professor of Art Education  
 LLOYD H. REYERSON, Ph.D., Assistant Professor of Chemistry  
 THOMAS S. ROBERTS, M.D., Professor of Ornithology  
 C. OTTO ROSENDAHL, Ph.D., Professor of Botany  
 CARL SCHLENKER, B.A., Professor of German  
 CARLYLE M. SCOTT, Professor of Music  
 FREDERICK H. SCOTT, Ph.D., M.B., B.Sc., Professor of Physiology  
 COLBERT SEARLES, Ph.D., Professor of Romance Languages  
 CHARLES F. SIDENER, B.S., Professor of Chemistry  
 CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology

- M. CANNON SNEED, Ph.D., Associate Professor of Chemistry  
J. WARREN STEHMAN, M.A., Assistant Professor of Economics  
ELMER E. STOLL, Ph.D., Professor of English  
FLETCHER H. SWIFT, Ph.D., Professor of Education  
JOSEPHINE E. TILDEN, M.S., Professor of Botany  
GUSTAVE VAN ROOSBROECK, Ph.D., Assistant Professor of Romance Languages  
MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Educational Psychology  
HERBERT WOODROW, Ph.D., Associate Professor of Psychology  
JEREMIAH S. YOUNG, Ph.D., Professor of Political Science  
ANTHONY ZELNY, Ph.D., Professor of Physics  
OTTO W. DAVIS, B.A., Lecturer in Sociology  
J. FRANKLIN EBERSOLE, M.A., Ph.B., Professorial Lecturer in Economics  
ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer in Romance Languages  
WILLIAM W. HODSON, B.A., LL.D., Lecturer in Sociology  
HARRY M. JOHNSON, Ph.D., Lecturer in Psychology  
JEAN H. ALEXANDER, M.A., Instructor in History and Philosophy of Education  
IRA S. ALLISON, B.A., Instructor in Geology and Mineralogy  
ANNE G. BENTON, B.A., Instructor in Bacteriology  
LOUIS A. BOETTIGER, M.A., Instructor in Sociology and Social Work  
HARRY S. CANNON, Ph.D., Instructor in German  
HUGH S. CARTER, B.A., Instructor in Sociology and Social Work  
NELSON F. COBURN, M.A., Instructor in Romance Languages  
JOSEPH E. CUMMINGS, M.A., Instructor in Economics  
LYNWOOD DOWNS, M.A., Instructor in German  
GEORGE FAIRCLOUGH, F.A.G.O., M.Mus., Instructor in Organ  
CHARLES L. FARABAUGH, B.S., Diplôme d'Etudes Supérieures, Instructor in Botany  
ROBERT G. GREEN, M.A., Instructor in Bacteriology  
JOHN W. GRUNER, M.S., Instructor in Geology and Mineralogy  
LEAH M. HANLEY, B.S., Instructor in Art Education  
CHARLES R. HOFFER, M.S., Instructor in Sociology  
GERTRUDE HULL, Instructor in Voice  
RICHARD JENTE, Ph.D., Instructor in German  
ARTHUR M. JOHNSON, Ph.D., Instructor in Botany  
CARL E. JOHNSON, Instructor in Architecture  
LEE O. LANTIS, M.A., Instructor in Sociology  
WALTER M. LAUER, M.S., Instructor in Chemistry  
HAZEL S. MARTIN, Instructor in Art Education  
ABE PEPINSKY, Instructor in Music  
GERTRUDE REEVES, Instructor in Music  
GEORGE S. H. ROSSOUW, M.A., Instructor in Sociology and Social Work  
KARL SCHEURER, Instructor in Music  
GEORGE M. SCHWARTZ, M.A., Instructor in Geology and Mineralogy

GLADYS SPEAKER, M.A., Instructor in Anthropology and Americanization Training

DAVID O. SPIESTERSBACH, M.S., Instructor in Bacteriology and Immunology

GEORGE A. THIEL, M.A., Instructor in Geology and Mineralogy

JOSEPH VALASEK, M.A., Instructor in Physics

W. COURTNEY WERNER, B.A., Instructor in Geology and Mineralogy

## FACULTY COMMITTEES

1922-1923

*Executive.*—The Executive Committee of the Department of Agriculture.

*Curriculum.*—Mr. Freeman, Miss Biester, Mr. A. Boss, Mr. Cheyney, Mr.

Eckles, Mr. Riley, Mr. Storm, Miss Weigley, Miss Weller, Mr. West.

*Enrolment.*—Mr. Field, Miss Clara Brown, Mr. Wentling, Mr. Morrow, Mr. West.

*Students' Work.*—Mr. Freeman, Miss Weigley, Mr. Alderman, Mr. Working, Mr. Cheyney, Mr. Nicholson, Mrs. Ladd, Mr. Storm, Mr. Carnes.

*Student Organizations.*—Mr. Lansing, Mr. Palmer, Miss Patchin, Miss Weller, Mr. Freeman.

*Faculty Business.*—Mr. Willaman, Mr. Rost, Miss Phelps, Mr. Keithley.

*Farm Experience.*—Mr. A. Boss, Mr. Alderman, Mr. Eckles.

*Program.*—Mr. Fitch, Mr. Allison, Mr. Ruggles, Mr. Hayes, Miss Child.

*Scholarships.*—Mr. Eckles, Miss Weigley, Mr. Gortner, Mr. Hayes, Mr. Black, Mr. Freeman.

## GENERAL INFORMATION

### ADMISSION

New students are admitted at the opening of any quarter provided a suitable program can be arranged. Prospective students, however, are advised to enter at the opening of the fall quarter if possible.

All students entering for the first time must submit their credentials to the Enrolment Committee.

Admission is either by certificate (in the case of graduates of accredited schools) or by examination. Candidates must have completed the equivalent of a four-year high school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the general information bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the bulletin of general information.

Applicants for admission are urged to present physics (1 unit) and chemistry (1 unit), for entrance credits. If these subjects are not completed in the high school, they will have to be taken in the University, thus postponing some of the vocational courses.

Every prospective student in agriculture is urged to obtain, before entering college, at least six months' practical experience on a farm. Entering students whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations. For students who major in dairy husbandry at least three of the six months of approved farm experience must be on an accredited dairy farm.

### FEES

Tuition fee (per quarter)	
Residents of Minnesota.....	\$20.00
Non-residents .....	30.00
Deposit (first quarter only).....	5.00
Military deposit (for all students registered for military drill).....	10.00
Health fee (per quarter).....	2.00
Minnesota Union or Shevlin Hall (per quarter).....	1.00
Post-office box (per quarter).....	.20



## Special fees

Itasca Park tuition (freshmen and juniors in forestry) prorated on basis of regular quarter tuition per quarter of 12 weeks.....	20.00
Physical Training for Women	
First year courses, per quarter.....	2.50
Other courses, per quarter.....	2.00
Maximum fee per quarter, \$3.50	
Vocal or instrumental music	
One hour per week, per quarter.....	25.00
Two hours per week, per quarter.....	45.00
Examination for removal of conditions.....	1.00
Examinations for credit (after the first quarter in residence).....	5.00
Special examinations .....	5.00
Change of registration.....	2.00

*Late registration.*—Old students must indicate their registration and pay their fees not later than two weeks before the day set for classes to begin. New students must complete their registration (including payment of fees) before the day set for classes to begin. The penalty for delay in either indicating or completing registration is two dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge is made for each day of delay after the last day set for payment of fees.

*Important.*—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

## FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

## REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to a total of 204 credit hours, with 204 honor points in agriculture and forestry; and 189 credit hours with 189 honor points in home economics, candidates will be recommended for graduation with the degree of bachelor of science.

## GRADING SYSTEM AND HONOR POINTS

There are four passing grades, A, B, C, and D, of which A is the highest and D the lowest. In addition there are the following non-passing grades: E (condition), F (failure) and I (incomplete). For rules governing the non-passing grades, see the booklet of Faculty Regulations.

Honor points are awarded on the following basis: each credit hour with a grade of A counts three honor points; each credit hour with a grade of B counts two honor points; and each credit hour with a grade of C counts one honor point. A grade of D counts no honor points.



CANDIDATES FOR THE TEACHER'S CERTIFICATE IN AGRICULTURE  
AND HOME ECONOMICS

The University teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. Students in the College of Agriculture, Forestry, and Home Economics desiring the University teacher's certificate shall in addition to their registration in this college register also in the College of Education. No formal application is necessary for transfer from the College of Agriculture, Forestry, and Home Economics to the College of Education if such transfer is made at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

## BOARD AND ROOM

*Sanford Hall.*—The one dormitory for University women, is located near the Minneapolis campus. It accommodates ninety women, about one half of whom may be freshmen. The charge for room and board is \$300 for the University year. Applications should be sent to the director of Sanford Hall, University of Minnesota.

*Home management houses.*—Two residences for women, located near the University Farm campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is \$90 each quarter, payable in advance. This covers the cost of living in the houses, with the exception of luncheon for the first five days of the week. Applications should be sent to the chief of the Division of Home Economics, University Farm, St. Paul. A deposit of \$10 is required when a room is reserved.

*Private houses.*—After June 1 the Housing Bureau will supply a list of approved boarding and rooming places.

## COURSES OF STUDY

### AGRICULTURE

(See pages 21 to 39.)

The course of study in agriculture provides an opportunity in the junior and senior years to major in one of the following groups:

1. Agricultural Economics and Farm Management
2. Agricultural Education and Agricultural Extension
3. Animal Industry
4. Agricultural Sciences and Plant Industry
5. Farm Engineering

Students are advised to follow one of the following suggested curricula:  
General courses in:

1. General Agriculture
2. Agricultural Economics
3. Agricultural Education (offered jointly with the College of Education)
4. Agricultural Engineering
5. Agricultural Extension
6. Animal Husbandry
7. Dairy Husbandry
8. Dairy Products
9. Farm Management
10. Fur-Farming
11. Horticulture
12. Landscape Gardening

Students desiring to specialize in one of the agricultural sciences with a view to further study in the Graduate School may arrange courses in the following fields:

1. Agricultural Biochemistry
2. Agricultural Economics
3. Agricultural Education
4. Agronomy and Farm Management
5. Animal Husbandry
6. Dairy Husbandry
7. Entomology and Economic Zoology
8. Horticulture
9. Plant Pathology and Botany
10. Soils
11. Veterinary Medicine

### AGRICULTURE-PRE-BUSINESS

Students desiring to prepare for admission to the School of Business may complete the Agriculture-Pre-Business course and in their junior and senior years, after entering the School of Business, major in:

1. General course in Agricultural Business
2. Marketing of Farm Products

## FORESTRY

(See pages 40 to 45.)

The course of study in forestry provides an opportunity in the junior and senior years to major in one of the following fields:

1. Sylviculture
2. Forest Organization and Management
3. Forest Products

Students are advised to follow one of the following suggested curricula:

1. Technical Forestry
2. Commercial Lumbering
3. Forest By-Products
4. Landscape Gardening

## HOME ECONOMICS

(See pages 46 to 51.)

The course of study in home economics provides an opportunity in the junior and senior years to follow one of the following outlined curricula:

1. General Home Economics, as a type of general arts education for women
2. Foods and Nutrition
3. Textiles and Clothing
4. Dietitians
5. Institution Management
6. Home Economics Extension

The following teachers' courses are also offered jointly with the College of Education:

7. General Home Economics
8. Foods and Home Management
9. Textiles and Clothing
10. Related Art

## EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s, indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 52 to 104. The program of classes is printed on pages 107 and following. The divisional statements are arranged alphabetically according to the names of the divisions.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

*Honor point*.—See page 16 for definition.

A *major* is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A *required* course is a course required of all students for graduation, irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

In planning registration note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of one honor point per credit must be maintained for the first two years in order to register for a Senior College elective.

## COURSES OF STUDY IN AGRICULTURE

The course of study is made up of 204 credit hours of work, including:

1. Required subject courses, 101 to 108 credit hours, *which every student must complete before graduation* (see below).
2. Elective subject courses, 96 to 103 credit hours, distributed according to several methods described below (page 22).

(For explanation of terms and course numbers, see page 19.)

### REQUIRED SUBJECT COURSES

Required subject courses, 101 to 108 credit hours, *are required of every student before graduation*. These constitute approximately half of the curriculum and are considered fundamental and necessary to any course of study in agriculture. Every student must complete these subject courses, if possible, before the end of the sophomore year.

For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

### FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.  
Freshman lectures. A course of six lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.
- Mil. Sci. 1f-2w-3s, Basic Course. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
- Phys. Educ. 1f,w,s, Personal Hygiene. Two hours per week for six weeks. Must be taken the first quarter in residence.
2. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.  
Agron. 1f,w,s, Farm Crops, 3  
An. Husb. 10f,w, Market Classes of Livestock, 5  
Bot. 4f-5w-6s, General Botany, 9  
Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.  
Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 may omit this course.  
Dy. Husb. 1f,w,s, Elements of Dairying, 5  
Farm Eng. 8f,w, Farm Engineering, 5  
Farm Eng. 11f,w,s, Applied Mathematics, 5  
For. 26f,w, Tree Crops, 1  
Hort. 6f, Fruit-Growing, 3; or Hort. 32s, Vegetable-Growing, 3

<sup>1</sup>Rhet. 1f,w,s, Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

<sup>1</sup>Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

#### SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours Mil. Sci. 4f-5w-6s, Basic Course. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses*.—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Chem. 10 cred.)

An. Biol. 14f-15w-16s, General Zoology, 9

Bact. 1f,w,s, General Bacteriology, 5 (Chem. 10 cred.)

Econ. 5f,w,s, Principles of Economics, 5

Econ. 6f,w,s, Agricultural Economics, 3 (Econ. 5)

Farm Eng. 3f,s, Mechanical Drawing, 2

Farm Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their course of study.

Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, Rhet. 22 advised) or Rhet. 31f,w,s, English Literature I, 5 (Rhet. 3)

Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

Soils 4f, Soils, 3 (Chem., 10 credits)

Soils, 5s, Soil Fertility, 3 (Soils 4)

#### ELECTIVE SUBJECT COURSES

##### JUNIOR AND SENIOR YEARS

Elective subject courses, 96 to 103 credits, may be distributed according to one of the following methods: A (see below) or B (page 23). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the course of study which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his course at the end of the sophomore year. A change from one method or course of study to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the course of study which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of courses of study.

##### Method A—*Open Elective Course of Study*

Recommended for those students who are preparing themselves for some special line of work and who have definitely in mind the relations of subjects offered to this work.

<sup>1</sup>Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 99.



Under this method the student, with the approval of his adviser, may select any course of study which complies with the following requirements:

- a. A major of from 24 to 36 credit hours.
- b. A minor of 18 credit hours.
- c. Limited electives amounting to 50 per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
- d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups, except that students whose major is chosen from Group 4 (see below). Agricultural Sciences and Plant Industry, may select their minor from a different field of work in the same group.

#### ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen

1. Agricultural Economics and Farm Management, including  
Agricultural Economics  
Farm Management
2. Agricultural Education<sup>1</sup> and Agricultural Extension, including  
Agricultural Education  
Agricultural Extension
3. Animal Industry, including  
Animal Husbandry  
Dairy Husbandry  
Poultry Husbandry  
Veterinary Medicine
4. Agricultural Sciences and Plant Industry, including  
Agricultural Biochemistry  
Agronomy  
Entomology and Economic Zoology  
Horticulture  
Plant Pathology and Botany  
Soils
5. Farm Engineering, including  
Farm Engineering

B. Groups from which electives only may be chosen

1. Bee Culture
2. Forestry
3. Home Economics
4. Military Science and Tactics
5. Physical Education
6. Rural Publications and Journalism
7. Courses in departments of other schools and colleges of the University

#### Method B—*Suggested Elective Courses of Study*

The following courses of study have been arranged and are recommended by the several departments as useful and suggestive. Changes may be made with the approval of the Students' Work Committee. The subject course programs and the offerings of subjects in different quarters are based primarily on these courses of study so that students will have an

<sup>1</sup> All students intending to teach agriculture are referred to the required curriculum in Agricultural Education, page 25.

opportunity of getting the subject courses in their proper sequence and without conflict. These specified courses are offered in the hope that they will also be of value to the student in vocational guidance. Students who desire to select any of these courses with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

### I. GENERAL AGRICULTURE

Recommended for those students who desire a general course in agriculture. It is designed especially for those who aim to obtain a broad general training and for those who expect to engage in general farming. It aims to emphasize two features, viz.: to include in its subject-matter the principal fields of study in agriculture and to select the essential courses necessary to an understanding of these fields. A sufficient number of electives is provided to permit the student to emphasize any special line in which he may become interested.

This course is completely included in the courses in agricultural education and agricultural extension, and in the general courses in farm management and agricultural economics. It is included, with only a few substitutions, in the courses in animal husbandry, dairy husbandry, and in horticulture.

#### JUNIOR YEAR

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
Agron. 121f, Cereal Crops, 3 (Agron. 1)  
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)  
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)  
Electives, 2 or 5

#### SENIOR YEAR

##### *Fall Quarter*

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)  
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)  
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
Electives, 3

##### *Winter Quarter*

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)  
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
Electives, 8

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)  
Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm mgt. and 5 cred. in soc. sciences)  
Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)  
Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)  
Electives, 2

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

*Spring Quarter*

Agron. 11s, Farm Machinery, 3	Vet. 8s, Veterinary Studies, 5
Agron. 123s, Forage and Fiber Crops, 3	Electives, 12
(Agron. 1)	
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)	
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)	
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)	
Electives, 2 or 5	

## 2. GENERAL COURSE IN AGRICULTURAL ECONOMICS

Suggested for those who desire to take a general course with emphasis upon agricultural economics. In addition to the subjects listed under the General Course in Agriculture, above, the student is advised to take the following:

- Econ. 28f,s, Principles of Accounting, 5 (Econ. 5)
- Econ. 50s, Farm Finance, 3 (Econ. 6)
- Econ. 108w, Marketing of Farm Products, 3 (Econ. 85)
- Econ. 116f,w, Economics of Agricultural Production, 3. (See tabular statement.)

For additional electives consult the Division of Agricultural Economics. A limited number of substitutions may be made in the subjects of the general course with the consent of the Students' Work Committee.

## 3. AGRICULTURAL EDUCATION

(Required for University teacher's certificate)

Students who desire to teach agriculture in the high schools or other secondary schools may obtain the University teacher's certificate in addition to the regular college degree, upon graduation, by registering in both the College of Education and the College of Agriculture, Forestry, and Home Economics in the junior and senior years. The following course has been approved by both colleges and is required of all students who are candidates for the University teacher's certificate.

The University teacher's certificate entitles the holder to teach agriculture in any Minnesota high school for two years. Upon satisfactory completion of the teaching of these two years, the holder may have the certificate renewed as a life certificate by approval of the president of the University and of the State Department of Education. Every student who expects to teach agriculture and who expects to obtain the University endorsement for a certificate must complete the subjects listed in this course.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 Agr. Educ. 21f, Vocational Education, 3  
 Agron. 121f, Cereal Crops, 3 (Agron. 1)  
 Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)  
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
 Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)

Agr. Educ. 41f,w,s, Apprentice Teaching, 2 (See tabular statement)  
 Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils, 5)  
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)  
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Electives, 1

*Winter Quarter*

Agr. Educ. 11f,w,s, Principles of Vocational Education, 3  
 Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)  
 An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)  
 An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Electives, 2

Agr. Educ. 42f,w, Teaching, 3 (See tabular statement)  
 Agr. Educ. 75w,s, Visual Presentation, 3 (Agr. Educ. 11)  
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)  
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)  
 Electives, 2

*Spring Quarter*

Agr. Educ. 131f,w,s, Methods in Teaching High School Agriculture, 5 (See tabular statement)  
 Agron. 11s, Farm Machinery, 3  
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)  
 An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)  
 Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)  
 Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)

Agr. Educ. 151w,s, Organization and Management, 5 (Agr. Educ. 11, 21)  
 Farm Eng. 40f,s, Mechanical Training, 3  
 Vet. 8s, Veterinary Studies, 5  
 Electives, 3

## 4. GENERAL COURSE IN AGRICULTURAL ENGINEERING

Suggested for those who intend to prepare for general farming, county agent work, etc. A general course with emphasis on engineering.

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 Agron. 121f, Cereal Crops, 3 (Agron. 1)  
 An. Husb. 11f, Types and Breeding of Livestock, 3 (An. Husb. 10)  
 Farm Eng. 5f, Framing and Building Construction, 3  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)

Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred.; An. Biol. 9 cred.)  
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)  
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)  
 Farm Eng. 18f, Surveying, 5 (Farm Eng. 8, 11 or equiv.)  
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class.)

*Winter Quarter*

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)  
 An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)  
 Farm Eng. 13w, Farm Motors I, 3  
 Electives, 2

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
 An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)  
 Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm management and 5 cred. in social sciences)  
 Farm Eng. 24w, Agricultural Physics I, 4 (Farm Eng. 8, 11, 23, or equiv.)  
 Electives, 4

*Spring Quarter*

Agron. 11f, Farm Machinery, 3  
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)  
 An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)  
 Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)  
 Farm Eng. 14s, Farm Motors II, 3 (Farm Eng. 13)  
 Electives, 2

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 Farm Eng. 25s, Agricultural Physics II, 4 (Farm Eng. 24)  
 Farm Eng. 31s, Principles of Drainage, 5 (Farm Eng. 18)  
 Farm Eng. 37s, Rural Sanitation, 3 (Farm Eng. 8)  
 Electives, 3

## 5. GENERAL COURSE IN AGRICULTURAL EXTENSION

Suggested for those who are preparing for county agent work or for some other phase of agricultural extension. For special modifications consult the Division of Agricultural Education.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 Agron. 121f, Cereal Crops, 3 (Agron. 1)  
 Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)  
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
 Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)  
 Electives, 2 or 5

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)  
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.



*Winter Quarter*

- Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)  
 Agr. Educ. 11f,w,s, Principles of Vocational Education, 3  
 An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)  
 An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Electives, 2
- Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 Agr. Educ. 75w,s, Visual Presentation, 3 (Agr. Educ. 11)  
 Agr. Educ. 131f,s, Methods of Teaching High School Agriculture, 5 (See tabular statement)  
 Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm mgt. and 5 cred. in soc. sciences)  
 Electives,<sup>2</sup> 3

*Spring Quarter*

- Agron. 11s, Farm Machinery, 3  
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)  
 An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)  
 Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)  
 Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)  
 Electives, 2 or 5
- Vet. 8s, Veterinary Studies, 5  
 Agr. Educ. 81s, Extension Work, 3 (6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. educ.)  
 Farm Eng. 40f,s, Mechanical Training, 3  
 Electives,<sup>2</sup> 6

## GENERAL COURSE IN ANIMAL HUSBANDRY

For those who aim to make a special study of livestock as a preparation for (a) various phases of livestock-farming and management, for (b) the technical positions relating to livestock, and for (c) further study in graduate work when the student desires to prepare for college, experiment station, and government research and similar positions requiring a still greater degree of specialization.

## JUNIOR YEAR

- Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)  
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Vet. 2f, Anatomy of Domestic Animals, 5

## SENIOR YEAR

*Fall Quarter*

- Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils, 5)  
 An. Husb. 101f, Advanced Stock-Judging, 3 (An. Husb. 2)  
 An. Husb. 7f, Meats, 3 (An. Husb. 2, Agr. Biochem. 15)  
 Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)  
 Vet. 6f, Physiology and Hygiene of Breeding, 3 (Vet. 3-4)  
 Electives, 1

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

<sup>2</sup> Agr. Educ. 82f,w,s, Agricultural Extension Field Course may be taken provided the student has pursued a broad curriculum approved by the Department of Agricultural Education and has obtained a position as assistant county agent approved by the Division of Agricultural Extension. The course carries from 3 to 10 credits based upon studies and reports to be made from time to time and evidences of proficiency obtained from other sources.



*Winter Quarter*

- Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)  
 An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)  
 An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Vet. 3w, Comparative Physiology, 3 (Vet. 2)  
 Electives, 2
- Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 An. Husb. 6w, Livestock-Feeding, 5 (Agr. Biochem. 15)  
 Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)  
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)  
 Vet. 12w, Infectious Diseases, 3 (Vet. 3-4, Bact. 1)

*Spring Quarter*

- Agron. 11s, Farm Machinery, 3  
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)  
 An. Husb. 2s, Livestock-Judging, 3 (An. Husb. 11-12)  
 An. Husb. 9s, Pedigrees and Herd Books, 3 (An. Husb. 5)  
 Vet. 4s, Comparative Physiology, 3 (Vet. 3)  
 Electives, 2
- An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 2)  
 An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 2)  
 An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 2)  
 An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 2)  
 An. Husb. 108s, Seminar, 3 (An. Husb. 5, 6)  
 Electives, 11

## 7. GENERAL COURSE IN DAIRY HUSBANDRY

Recommended for those students who plan definitely to engage in dairy farming or in some practical branch of dairy production.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

- Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)  
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)  
 Vet. 2f, Anatomy of Domestic Animals, 5
- Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
 Agron. 121f, Cereal Crops, 3 (Agron. 1)  
 Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)  
 Dy. Husb. 105f, Seminar I, 1 (3 courses in dy. husb.)  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Vet. 6f, Physiology and Hygiene of Breeding, 3 (Vet. 3-4)

*Winter Quarter*

- Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)  
 An. Husb. 6w, Livestock-Feeding, 5 (Agr. Biochem. 15)  
 An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
 Dy. Husb. 2w,s, Dairy Bacteriology, 5 (1, Bact. 1)  
 Vet. 3w, Comparative Physiology, 3 (Vet. 2)
- Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)  
 Dy. Husb. 103w, Dairy Stock-Feeding, 3 (Dy. Husb. 101, Agr. Biochem. 15)  
 Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)  
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

*Spring Quarter*

- Agron. 123s, Forage and Fiber Crops, 3  
 (Agron. 1)  
 Dy. Husb. 104s, Advanced Study of Dairy Breeds, 3 (Dy. Husb. 6, 101)  
 Econ. 85f,s, Principles of Marketing, 3  
 (Econ. 6)  
 Vet. 4s, Comparative Physiology, 3  
 (Vet. 3)  
 Electives, 3
- Agron. 11s, Farm Machinery, 3  
 Dy. Husb. 107s, Seminar III, 1 (3 courses in dy. husb.)  
 Electives, 12

## 8. GENERAL COURSE IN DAIRY PRODUCTS

Those desiring to specialize in dairy products are advised to follow the group plan of electives. The major and minor groups will be arranged to include most of the courses in the General Course in Dairy Husbandry, and in addition the following of special importance to one interested in this field of work.

- Agr. Biochem. 103s, Dairy Chemistry, 5 (Agr. Biochem. 7-8)  
 Dy. Husb. 111f, Dairy Products I, 3 (Dy. Husb. 1, 2)  
 Dy. Husb. 112s, Dairy Products II, 3 (Dy. Husb. 1, 2)  
 Dy. Husb. 102s, Market Milk, 3 (Dy. Husb. 1, 2)  
 Econ. 28s, Principles of Accounting, 5 (Econ. 5)

## 9. GENERAL COURSE IN FARM MANAGEMENT

Suggested for those who desire a broad training in agriculture in preparation for general farm management. This includes the subjects of the general course and suggested electives which add an emphasis upon those subjects which bear on technical farm management.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

- Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 Agron. 121f, Cereal Crops, 3 (Agron. 1)  
 Agron. 131f, Principles of Genetics, 3  
 (Bot. 9 cred., An. Biol. 9 cred.)  
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
 Econ. 85f,s, Principles of Marketing, 3  
 (Econ. 6)  
 Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)  
 Electives, 0 or 2
- Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
 Dy. Husb. 6f, Judging Dairy Cattle, 1  
 (An. Husb. 1)  
 Dy. Husb. 101f, Milk Production, 5  
 (Dy. Husb. 1)  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Elective, 3

*Winter Quarter*

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)	Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)	Econ. 108w, Marketing of Farm Prod- ucts, 3 (Econ. 85)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)	Econ. 117w, <sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)	Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
Electives, 5	Sociol. 14f,w, Rural Sociology, 3 (sr. class. or Sociol. 1)
	Electives, 2

*Spring Quarter*

Agron. 11s, Farm Machinery, 3	Agron. 104s, Farm Management III, 3 (Agron. 101, 102)
Agron. 101s, Farm Management I, 3 (Agron. 1, Econ. 6)	Vet. 8s, Veterinary Studies, 5
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)	Electives, 9
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)	
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)	
Electives, 2 or 4	

## 10. FUR-FARMING

The prices for furs during the past few years have stimulated greatly the interest in fur-bearing animals. Some fox farms and skunk farms have been established and other fur-bearing animals are being raised with a view to supplying furs for the trade. This has aroused frequent inquiry for a course that would fit students for such work either as a business or in connection with other farm enterprises. The college does not offer a special curriculum for students desiring to engage in fur-farming but the important studies underlying such a course are already provided by the required work of the curriculum of the College of Agriculture, Forestry, and Home Economics. Certain elective courses are also available which under faculty regulations may be so chosen as to meet the needs of students wishing to specialize in fur-farming.

## 11. GENERAL COURSE IN HORTICULTURE

A foundation course suggested for those who purpose to engage in the production or horticultural crops or to enter into some horticultural business.

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

## JUNIOR YEAR

*Fall Quarter*

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)  
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)  
 Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)  
 Hort. 56f, Propagation and Nursery Practice, 3  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Electives, 0 or 3

## SENIOR YEAR

Agron. 121f, Cereal Crops, 3 (Agron. 1)  
 Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32)  
 Hort. 107f, Orchard Management, 3 (Hort. 6, Bot. 9 cred.)  
 or  
 Hort. 131f, Advanced Vegetable Production, 3 (Hort. 32, Bot. 9 cred.)  
 Hort. 109f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)  
 Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)  
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)  
 Electives, 2

*Winter Quarter*

An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)  
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Hort. 21w, Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)  
 Hort. 135w, Potato Production, 3 (Hort. 6 or 32, Bot. 9 cred.)  
 Electives, 5

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
 An. Husb. 5w, Livestock-Breeding, 3 (Hort. 109)  
 or  
 Hort. 110w, Horticultural Crop-Breeding, 3 (Hort. 109)  
 Econ. 117w,<sup>1</sup> Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)  
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)  
 Hort. 194w, Horticultural Seminar, 1 (Hort. 193)  
 Electives, 4

*Spring Quarter*

Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)  
 An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)  
 Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, Org. Chem. advised)  
 or  
 Vet. 8s, Veterinary Studies, 5  
 Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)  
 Electives, 3 or 6

Agron. 11s, Farm Machinery, 3  
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)  
 Electives, 8

<sup>1</sup> Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

## 12. LANDSCAPE GARDENING

A suggested course for students majoring in landscape gardening.

## JUNIOR YEAR

*Fall Quarter*

Arch. 21f,w, Free-Hand Drawing, 2  
 Hort. 56f, Propagation and Nursery Practice, 3  
 Hort. 72f, Plant Materials, 3  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.) or Pl. Path. 10f, Forest Pathology, 5 (Bot. 9 cred.) Not required of students who have completed Pl. Path. 10 as a part of the general requirements in forestry.  
 Soils 4, Soils, 3 (Chem. 10 cred.) Not required of students who have completed this course as a part of the general requirements in agriculture.  
 Electives, 4 or 6

## SENIOR YEAR

Farm Eng. 18f, Surveying, 5 (Farm Eng. 3, 11, or equiv.)  
 Hort. 75f, Landscape Design I, 3 (Hort. 74, Draw. 10 cred.)  
 Pol. Sci. 51f, Business Law, 3  
 Electives, 6

*Winter Quarter*

Arch. 22w,s, Free-Hand Drawing, 2  
 For. 27w, Groves and Windbreaks, 3  
 For students who have completed the freshman and sophomore years in agriculture, or  
 For. 35w, Seeding and Planting, 3 (For. 3-4) For students who have completed the freshman and sophomore years in forestry.  
 Hort. 74w, Principles of Landscape Design, 3 (Hort. 72)  
 Electives, 9

Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)  
 Hort. 76w, Landscape Design II, 3 (Hort 75)  
 Hort. 191w, Special Problems, 3 (Instructor's permission)  
 Pol. Sci. 52w, Business Law, 3  
 Electives, 5

*Spring Quarter*

Arch. 23s, Free-Hand Drawing, 2  
 Farm Eng. 38s, Advanced Mechanical Drawing, 2  
 Hort. 50s, Floriculture, 3  
 Hort. 73s, History of Landscape Design, 3  
 Soils 5, Soil Fertility, 3 (Soils 4). Not required of those who have completed this course as a part of the general requirements in agriculture.  
 Electives, 4 or 7

C. E. 53s, Municipal Engineering, 3  
 Farm Engineering 31s, Principles of Drainage, 5 (Farm Eng. 3, 11, or equiv.)  
 Hort. 192s, Special Problems, 2 (Hort. 191)  
 Electives, 6.

## SPECIAL COURSES IN AGRICULTURAL SCIENCES

Opportunity is offered to students who desire to specialize in the various branches of agriculture and agricultural sciences. In all cases it is assumed that such students will spend one or more years in graduate study. Only those students who have had high scholarship records in their undergraduate course and who have a clear understanding of the study to be pursued and who have a lasting and abiding enthusiasm for the chosen field of specialization should enter upon these courses. Since a comparatively small num-



ber of students will enter these special courses and since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines. The student is referred to the various divisions concerned and is advised to construct a curriculum in accordance with the open elective system, (Method A, page 22). The student, however, would do well to include in his course as many of the subjects listed under the General Course in Agriculture as are consistent with his special course. The attention of the student is also called to the modern language requirements for graduate students. In many divisions French or German is required for the Master's degree and in all cases both French and German are required for a degree of doctor of philosophy. At least one modern language should be obtained during the undergraduate work.

Students in these courses may prepare themselves for teaching in colleges and universities, for research and experimental work in experiment stations, for regulatory, experimental, and extension service in the state and Federal departments of agriculture and for various technical and industrial positions in agricultural industries and in the industries related to agriculture. For the opportunities offered, the student is advised to consult with the various divisions and with the dean of the college.

Special courses are offered in the following fields:

#### I. AGRICULTURAL BIOCHEMISTRY

Positions open to graduates from an agricultural biochemistry course are:

Control chemists in flour mills or the grain trade  
 Control chemists in state department control laboratories  
 Junior chemist, U. S. Department of Agriculture, Bureau of Chemistry  
 Assistants or instructors in other colleges or universities  
 Assistant chemist in agricultural experiment station  
 Chemists or assistants in hospitals or medical laboratories  
 Chemical positions with industrial corporations, especially those dealing with biological or agricultural products, etc.

Students specializing in agricultural biochemistry are expected to complete the following courses:

- Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8). Optional with Agr. Biochem. 108, 110  
 Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6 (Agr. Biochem. 7-8)  
 Agr. Biochem. 103s, Dairy Chemistry, 5 (Agr. Biochem. 7-8). Optional with Agr. Biochem. 108, 110; and 15, 116  
 Agr. Biochem. 108s, Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 7-8). Optional with Agr. Biochem. 15, 103; and 15, 116  
 Agr. Biochem. 110s, Flour Laboratory Methods, 5 (Agr. Biochem. 101-102, or Chem. 131-132). Optional with Agr. Biochem. 15, 103; and 15, 116  
 Agr. Biochem. 111f-112w, Phytochemistry, 6 (Biol. 9 cred., organ. chem.)  
 Agr. Biochem. 113f-114w, Biochemical Laboratory Methods, 4 (quant. anal., Agr. Biochem. 111-112 parallel)  
 Agr. Biochem. 116w, Advanced Animal Nutrition, 2 (Agr. Biochem. 111-112, 113, 114; or Physiol. 101-102; or Agr. Biochem. 7-8, 15). Optional with Agr. Biochem. 108, 110; and 15, 103

Agr. Biochem. 118f,w,s, Laboratory Problems in Biochemistry, 3 or 5 (Agr. Biochem. 111-112, 113-114, or 103 or 110)  
 Chem. 35f-36w, Organic Chemistry, 10 (Chem. 15 cred.)  
 Ger. 1f,w,s, Beginning German A, 5  
 Ger. 2f,w,s, Beginning German B, 5 (Ger. 1 or 1 yr. prep. Ger.)  
 Phys. 1f,w,s, Elements of Mechanics and Sound, 3 (trigonometry)  
 Phys. 2f,w,s, Elements of Mechanics Laboratory, 1 (Phys. 1 or parallel)  
 Phys. 21f,w, Heat, 3 (Phys. 1)  
 Phys. 22f,w, Heat Laboratory, 1 (Phys. 2, 21, or parallel)  
 Phys. 41w,s, Magnetism and Electricity, 3 (Phys. 1)  
 Phys. 42w,s, Magnetism and Electricity Laboratory, 1 (Phys. 2, 41, or parallel)

At least 10 credits should be selected from the following courses, all of which are highly desirable:

An. Biol. 17f-18w, General Physiology, 10 (14 cred. in an. biol., or 9 cred. in an. biol. and 10 cred. in chem. or phys.)  
 Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, org. chem. advised)  
 Chem. 140f-141w-142s, Physical Chemistry, 9, 12, or 15 (2 yrs. chem., 1 yr. phys.)  
 Math. 30f,w,s, Analytical Geometry, 5 (Math. 6, 7)  
 Math. 50f,w,s, Calculus I, 5 (Math. 30)  
 Math. 51w,s, Calculus II, 5 (Math. 50)  
 Physiol. 100f-101w, Physiologic Chemistry, 12 (org. chem., phys., an. biol.)  
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)  
 Soils 101f, Chemical Analysis of Soils, 3-5 (quant. anal., Soils 5)

## 2. AGRICULTURAL ECONOMICS

Those students who plan to specialize in agricultural economics are advised to include the following subjects in their course of study, and to consult with the Department of Agricultural Economics in regard to the remaining subjects. Substitution will be made to suit the needs of each student.

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)  
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)  
 Econ. 13f, Agricultural Statistics, 5 (Econ. 5)  
 Econ. 28s, Principles of Accounting, 5 (Econ. 5)  
 Econ. 50s, Farm Finance, 3 (Econ. 6)  
 Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)  
 Econ. 106w,s, Land Economics, 3 (sr. class. or 13 cred. in econ. and farm mgt., and 5 cred. in other soc. sciences)  
 Econ. 108w, Marketing of Farm Products, 3 (Econ. 85)  
 Econ. 116f,w, Economics of Agricultural Production, 3 (same prereq. as Econ. 106)  
 Econ. 117w, Prices of Farm Products, 3 (same prereq. as Econ. 106)  
 Econ. 126f, Principles of Cooperation, 3 (Econ. 85 or same prereq. as Econ. 106)

## 3. AGRICULTURAL EDUCATION

Consult Department of Agricultural Education for outline of course of study.

## 4. AGRONOMY AND FARM MANAGEMENT

Consult Division of Agronomy and Farm Management for outline of course of study.

## 5. ANIMAL HUSBANDRY

The General Course listed on page 24 is also designed as a preparation for special advanced study.

## 6. DAIRY HUSBANDRY

Those who desire to specialize in dairy husbandry should consult with the Division of Dairy Husbandry regarding the arrangement of their course. Special care will be given to arrange a well-rounded course of study in the fundamental sciences and applied subjects closely related to dairy husbandry. Those preparing for college, experiment station, or government positions, are advised to elect one foreign language.

## 7. ENTOMOLOGY AND ECONOMIC ZOOLOGY

Consult the Division of Entomology and Economic Zoology for outline of course of study.

## 8. HORTICULTURE

Consult the Division of Horticulture for outline of course of study.

## 9. PLANT PATHOLOGY AND BOTANY

Consult the Division of Plant Pathology and Botany for outline of course of study.

## 10. SOILS

Students are expected to complete the courses listed below and for the remaining courses should consult with the division.

Chem. 20w-21s, Quantitative Analysis, 10 (Chem. 12-13)  
 Chem. 35f-36w, Organic Chemistry, 10 (15 cred. in chem.)  
 Geol. 1f,w,s-2w,s, General Geology, 10 (Chem. 10 cred.)  
 Geol. 21w-22s, Essentials of Mineralogy, 6 (Chem. 10 cred.)  
 Math. 30f,w,s, Analytical Geometry, 5 (Math. 6, 7)  
 Math. 50f,w,s, Calculus I, 5 (Math. 30)  
 Math. 51w,s, Calculus II, 5 (Math. 50)  
 Phys. 1f,w,s, Elements of Mechanics and Sound, 3 (trigonometry)  
 Phys. 2f,w,s, Elements of Mechanics Laboratory, 1 (Phys. 1 or parallel)  
 Phys. 21f,w, Heat, 3 (Phys. 1)  
 Phys. 22f,w, Heat Laboratory, 1 (Phys. 2, 21, or parallel)  
 Phys. 41w,s, Magnetism and Electricity, 3 (Phys. 1)  
 Phys. 42w,s, Magnetism and Electricity Laboratory, 1 (Phys. 2, 41, or parallel)

## 11. VETERINARY MEDICINE

Consult the Division of Veterinary Medicine for outline of course of study.

## AGRICULTURE—BUSINESS COURSE

This course offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The first two years are practically prescribed

and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics. The junior and senior years are offered in the School of Business. The transfer to the School of Business may be made without petition when the required work of the freshman and sophomore years outlined below has been completed with a minimum of 102 credits and 102 honor points. For definition of "honor point" see page 16. Approximately half of the last two years is elective and may include advanced courses in agriculture and economics.

#### FRESHMAN AND SOPHOMORE YEARS

The outline for these years is the same as the Course in Agriculture (see pages 21 to 22) except that the following courses are omitted:

Agr. Biochemistry 7-8, General Agricultural Biochemistry, 10  
 Bact. 1, Elementary Bacteriology, 5  
 Farm Eng. 3, Mechanical Drawing, 2  
 Farm Eng. 11, Applied Mathematics, 5  
 Farm Eng. 23, General Physics, 5  
 Rhet. 11, Argumentation, 3; or Rhet. 31, English Literature I, 5  
 Rhet. 22, Public Speaking, 3  
 Soils 4, Soils, 3  
 Soils 5, Soil Fertility, 3

The following courses are added:

Econ. 20s, Economic Geography of Agriculture, 5 (must be taken in the freshman year)  
 Econ. 21w, Economic History of Agriculture, 5 (must be taken in the freshman year)  
 Econ. 25f,w-26w,s, Principles of Accounting, 8 (3-4 or 5, or parallel; not open to freshmen)

Econ. 13f, Agricultural Statistics, 5 (Econ. 3-4, or 5. Not open to freshmen)

Electives sufficient to make a total of 102 credit hours, to be selected from the courses omitted from the first two years of the Agriculture Course

#### JUNIOR AND SENIOR YEARS

The courses dealing with agricultural business which are offered by the School of Business and the College of Agriculture, Forestry, and Home Economics during the last two years are arranged by School of Business into two lines of specialization: (1) General Course in Agricultural Business, and (2) Course in Marketing of Farm Products. Outlines of these courses of study appear below.

##### I. GENERAL COURSE IN AGRICULTURAL BUSINESS

###### JUNIOR YEAR

###### SENIOR YEAR

###### *Fall Quarter*

Econ. 51f, Business Law, 3 (10 cred. in econ.)

Econ. 85f,s, Principles of Marketing, 3 (Econ. 3-4 or 5, 6)

Econ. 143f, The Financial System, 4, (Econ. 3-4 or 5, 6)

Econ. 103f, Value and Distribution, 3 (Econ. 3-4 or 5, 6)

Econ. 116f,w, Economics of Agricultural Production, 3 (See tabular statement)

Econ. 126f, Principles of Coöperation, 3 (Econ. 85, or see tabular statement)

*Winter Quarter*

- |  |   |
|--|---|
| Agron. 102f,w, Farm Management II:<br>Organization, 3 (Agron. 1, Econ. 6,<br>An. Husb. 6 or 8, Soils 5)<br>Econ. 52w, Business Law, 3 (Econ. 51)<br>Econ. 73w, Railway Traffic and Rates, 3<br>(Econ. 3-4 or 5, 6)<br>Econ. 144w, The Financial System, 4<br>(Econ. 143) | Econ. 104w, Value and Distribution, 3<br>(Econ. 103)<br>Econ. 106w,s, Land Economics, 3 (See<br>tabular statement)<br>Econ. 117w, Prices of Farm Products, 3<br>(See tabular statement) |
|--|---|

*Spring Quarter*

- |   |   |
|---|---|
| Agron. 103w,s, Farm Management II:<br>Operation, 3 (Agron. 102)<br>Econ. 50s, Farm Finance, 3 (Econ. 3-4 or<br>5, 6)<br>Econ. 53s, Business Law, 3 (Econ. 52) | Econ. 107s, Land Tenure, 3 (Econ. 106)<br>Econ. 149s, Business Cycles, 3 (Econ.<br>143-144) |
|---|---|

## RECOMMENDED ELECTIVES

Advanced courses in technical agriculture dealing with special products.

- Econ. 72f, Economics of Transportation, 3 (Econ. 3-4, 5, 6)  
 Econ. 88w, Advertising and Selling, 3 (Econ. 85)  
 Econ. 90s, Economics of Consumption, 3 (Econ. 3-4 or 5, 6)  
 Econ. 112f, Business Statistics, 3 (Econ. 13 or 14)  
 Econ. 155s, Corporation Finance, 3 (Econ. 143-144)  
 Econ. 176f, Commercial Policies, 3 (Econ. 3-4 or 5, 6)  
 Econ. 177w, Foreign Trade, 3 (Econ. 176)  
 Econ. 191f-192w, Public Finance, 6 (Econ. 3-4 or 5, 6)

## 2. MARKETING OF FARM PRODUCTS

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

- |  |  |
|--|--|
| Econ. 51f, Business Law, 3 (10 cred. in<br>econ.)<br>Econ. 85f,s, Principles of Marketing, 3<br>(Econ. 3-4 or 5, 6)<br>Econ. 143f, The Financial System, 4,<br>(Econ. 3-4 or 5, 6) | Econ. 103f, Value and Distribution, 3<br>(Econ. 3-4 or 5, 6)<br>Econ. 111f, Practice Course in Market-<br>ing, 2 (Econ. 110)<br>Econ. 126f, Principles of Coöperation, 3<br>(Econ. 85, or see tabular statement) |
|--|--|

*Winter Quarter*

- |   |   |
|---|---|
| Econ. 52w, Business Law, 3 (Econ. 51)<br>Econ. 73w, Railway Traffic and Rates, 3<br>(Econ. 3-4 or 5, 6)<br>Econ. 144w, The Financial System, 4<br>(Econ. 143) | Econ. 104w, Value and Distribution, 3<br>(Econ. 103)<br>Econ. 108w, Marketing of Farm Prod-<br>ucts, 3 (Econ. 85)<br>Econ. 117w, Prices of Farm Products, 3<br>(See tabular statement)<br>Econ. 127w, Marketing Organization and<br>Management, 3 (Econ. 85, 25-26 or 28) |
|---|---|

*Spring Quarter*

- |  |   |
|--|---|
| Econ. 53s, Business Law, 3 (Econ. 52)<br>Econ. 90s, Economics of Consumption, 3<br>(Econ. 3-4 or 5, 6) | Econ. 110s, Practice Course in Market-<br>ing, 1 (Econ. 25-26 or 28, 85, 108)<br>Econ. 128s, Marketing Organization and<br>Management, 3 (Econ. 127)<br>Econ. 149s, Business Cycles, 3 (Econ.<br>143-144) |
|--|---|



## RECOMMENDED ELECTIVES

- Advanced courses in technical agriculture dealing with special products.  
Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6)  
Econ. 72f, Economics of Transportation, 3 (Econ. 3-4 or 5, 6)  
Econ. 88w, Advertising and Selling, 3 (Econ. 85)  
Econ. 106w,s, Land Economics, 3 (See tabular statement)  
Econ. 107s, Land Tenure, 3 (Econ. 106)  
Econ. 116f,w, Economics of Agricultural Production, 3 (See tabular statement)  
Econ. 145s, Foreign Exchange, 3 (Econ. 143-144)  
Econ. 155s, Corporation Finance, 3 (Econ. 143-144)  
Econ. 176f, Commercial Policies, 3 (Econ. 3-4 or 5, 6)  
Econ. 177w, Foreign Trade, 3 (Econ. 176)

## COURSES OF STUDY IN FORESTRY

The course of study is made up of 204 credit hours of work including:

1. Required subject courses, 103 to 110 credit hours, which every student must complete. These constitute approximately one half of the curriculum and are considered as fundamental to any course in forestry. In most cases these will be completed in the freshman and sophomore years.

2. Elective subject courses, 94 to 101 credit hours, distributed according to several methods described below (page 41).

(For explanation of terms and course numbers, see page 19.)

### REQUIRED SUBJECT COURSES

Required subject courses, 103 to 110 credit hours are required of every student before graduation. These constitute approximately half of the curriculum and are considered fundamental and necessary to any course of study in forestry. For some students the outline for the first two years, given below represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter (summer quarter at Itasca Park, 6 credit hours), will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

#### FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.  
Freshman lectures. A course of six lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.  
Mil. Sci. 1f-2w-3s, Basic Course. Three hours per week throughout the freshman year. Students found to be physically unfit may be required to substitute corrective exercises in gymnasium.  
Phys. Educ. 1f,w,s, Personal Hygiene
2. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.  
Bot. 4f-5w-6s, General Botany, 9  
Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.  
Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.) Those required to take Chem. 1-2-3 are exempt.  
Farm Eng. 3f,s, Mechanical Drawing, 2  
Farm Eng. 11f,w,s, Applied Mathematics, 5  
For. 1f,s, General Forestry, 4  
For. 3w-4s, Dendrology, 8 (Bot. 4)  
<sup>1</sup>Rhet. 1f,w,s, Rhetoric I, 3  
Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)  
Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)  
<sup>1</sup>Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

<sup>1</sup>Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 99.

*Itasca Park (Summer Session)*

- For. 2su, Elementary Dendrology, 2  
 For. 5su, Elementary Silviculture, 2  
 For. 9su, Elementary Mensuration, 2

## SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.  
 Mil. Sci. 4f-5w-6s, Basic Course. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses*.—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.  
 An. Biol. 14f-15w-16s, General Zoology, 9  
 Bot. 7s, Taxonomy of Flowering Plants, 5 (Bot. 2, 5, or 8)  
 Econ. 5f,w,s, Principles of Economics, 5  
 Farm Eng. 23f,s, General Physics, 5. Those presenting a unit of high school physics for entrance may omit this course and substitute 5 credits elective later in their course of study.  
 For. 47f-48w, Forest Products, 6  
 Geol. 29f, General Physiography, 5  
 Pl. Path. 10f, Forest Pathology, 5 (Bot. 4-5-6)  
 Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

## JUNIOR YEAR

1. *Sophomore courses* which were not completed during the sophomore year.
2. *General courses*.—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.  
 Ent. 6w, Insects of Forest Products, 3 (An. Biol. 9 cred.)  
 For. 33f-34w, Wood Structure and Identification, 6 (For. 3-4, Bot. 4-5-6)  
 For. 41f, Silvics, 3 (For. 3-4, Bot. 4-5-6)
3. *Special courses and electives* as prescribed in one of the suggested courses of study pages 43 to 45 or enough electives selected on the major-minor group system (see below) to make from 15 to 18 credit hours per quarter. Full work for the year consists of 51 credit hours.

## ELECTIVE SUBJECT COURSES

2. Elective subject courses 94 to 101 credits, may be distributed according to one of the following methods: A (page 42) or B (page 43). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the course of study which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his course at the end of the sophomore year. A change from one method or course of study to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the course which he finally selects. Such changes

usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of courses of study.

#### Method A—*Open Elective Course of Study*

Recommended for those students who are preparing themselves for some special line of work and who have definitely in mind the relations of subjects offered to this work.

Under this method the student with the approval of his adviser may select any course of study which complies with the following requirements:

- a. A major of from 24 to 36 credit hours.
- b. A minor of 18 credit hours.
- c. Limited electives amounting to 50 per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
- d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups.

#### ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen.

##### 1. Silviculture

- Bot. 20f, Forest Ecology, 3
- Bot. 22f,s, Elementary Plant Physiology, 5
- Bot. 113f-114w-115s, Advanced Taxonomy, 9
- Bot. 131f, Field Ecology, 5
- Bot. 132s, Ecological Anatomy, 5
- Bot. 133s, Forest Geography of North America, 5
- Bot. 141f-142w-143s, Advanced Plant Physiology, 15
- For. 27w, Groves and Windbreaks, 3
- For. 35w, Seeding and Planting, 3
- For. 43s, Silviculture Laboratory, 5 (Itasca Park)
- For. 101w, Advanced Dendrology, 3
- For. 106w, Investigative Methods in Forestry, 3

##### 2. Forest Organization and Management

- Econ. 28f,s, Principles of Accounting, 5
- Econ. 85f,s, Principles of Marketing, 3
- Econ. 91w,s, Principles of Organization and Management, 3
- Econ. 143f-144w, The Financial System, 8
- Econ. 155s, Corporation Finance, 3
- Econ. 167w, Industrial Relations, 3
- Ent. 7s, General Forest Entomology, 1 (Itasca Park)
- Farm Eng. 18f, Surveying, 5
- For. 10w, Mensuration, 5
- For. 11f, Forest Valuation, 5
- For. 20w, Grazing, 3
- For. 28w, Logging, 3
- For. 32w, Lumber Distribution, 5
- For. 36w, Forest Policy and Administration, 5
- For. 46s, Forest Regulation Laboratory, 5 (Itasca Park)
- For. 112w, Advanced Forest Mensuration, 3.

##### 3. Forest Products

- Agr. Biochemistry 2f, Quantitative Methods, 5
- Agr. Biochem. 3f,w,s, Types of Carbon Compounds, 6

Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6

Agr. Biochem. 111f-112w, Phytochemistry, 6

Agr. Biochem. 113f-114w, Biochemistry Laboratory, 4

or

Chem. 11f,s, Qualitative Chemical Analysis, 4

Chem. 27f, Quantitative Chemistry, 4

Chem. 35f-36w, Organic Chemistry, 10

For. 23su, Factory Experience, 3 to 5

For. 29f, Sawmills and Wood-Working Machinery, 3

For. 30s, Wood-Seasoning, 3

For. 39f, Wood-Preservation, 3

For. 44s, Wood Pulp and Paper, 3

For. 47f-48w, Forest Products, 6

For. 107f-108w 109s, Uses of Wood, 9

For. 110w, Mechanical and Physical Properties of Wood, 2

For. 119f-120w, Advanced Wood Structure, 6

For. 113w, Advanced Forest By-Products, 3

#### 4. Forest Sciences

Includes any courses offered in the fields of

Chemistry

Ecology

Entomology and Zoology

Plant Pathology

B. Groups from which electives only may be chosen

1. Courses in other divisions of the College of Agriculture, Forestry, and Home Economics, not listed in major groups

2. Military Science and Tactics

3. Physical Education

4. Courses in departments of other schools and colleges of the University, not included in major groups

### Method B—*Suggested Elective Courses of Study*

The following courses of study have been arranged and are recommended by the several departments as useful and suggestive. Changes may be made with the approval of the Students' Work Committee. The subject course programs and the offerings of subjects in different quarters are based primarily on these courses of study so that students will have an opportunity of getting the subject courses in their proper sequence and without conflict. These specified courses are offered in the hope that they will also be of value to the student in vocational guidance. Students who desire to select any of these courses with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

#### 1. COURSE IN TECHNICAL FORESTRY

Suggested for those who are preparing themselves for technical forest work, such as positions in the federal or state services, or foresters for paper companies, lumber companies, or other large timber owners, involving the growth, management, and harvesting of forest crops.



## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

Bot. 20f, Forest Ecology, 3 (Bot. 2 or 5,  
For. 1)  
Farm Eng. 18f, Surveying, 5 (Farm Eng.  
3, 11, or equiv.)  
For. 33 and 41, see general requirements,  
page 41.  
Electives, 3

Bot. 22f,s, Elementary Plant Physiology,  
5 (Bot. 2 or 5, Org. Chem. advised)  
Bot. 131f, Field Ecology, 5 (Bot. 20 or  
21)  
For. 11f, Forest Valuation, 5 (For. 10,  
41)  
Electives, 2

*Winter Quarter*

Ent. 6, see general requirements, page 41  
For. 10w, Forest Mensuration, 5 (For.  
3-4)  
For. 20w, Grazing, 3  
For. 34, see general requirements, page 41.  
For. 35w, Seeding and Planting, 3 (For.  
3-4)

For. 27w, Groves and Windbreaks, 3  
For. 28w, Logging, 3 (For. 3-4)  
For. 36w, Forest Policy and Administra-  
tion, 5 (For. 11, 43, 28 parallel)  
For. 106w, Investigative Methods, 3  
(For. 43)  
Electives, 3

*Spring Quarter*

(Itasca Park)  
Ent. 7s, General Forest Entomology, 1  
(Ent. 6)  
For. 43s, Sylviculture Laboratory, 5  
(For. 35)  
For. 46s, Forest Regulation Laboratory,  
5 (For. 11)

Electives, 17

## 2. COURSE IN COMMERCIAL LUMBERING

Suggested for those who wish to enter any branch of lumber business. Includes fundamental business courses and a thoro training in the structure, handling, and uses of wood.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

Econ. 85f,s, Principles of Marketing, 3  
(Econ. 3-4 or 5)  
For. 29f, Sawmills and Wood-Working  
Machinery, 3 (For. 3-4)  
For. 33 and 41, see general requirements,  
page 41  
For. 39f, Wood Preservation, 3 (For.  
33 parallel)  
Electives, 2

Econ. 143f, The Financial System, 4  
(Econ. 3-4 or 5)  
For. 107f, Uses of Wood I, 3 (For.  
33-34)  
Pol. Sci. 51f, Business Law, 3 (Econ.  
10 cred.)  
Electives, 7

*Winter Quarter*

Econ. 91w,s, Principles of Organization  
and Management, 3 (Econ. 3-4 or 5)  
Ent. 6, see general requirements, page 41  
For. 10w, Forest Mensuration, 5 (For.  
3-4)  
For. 34, see general requirements, page 41  
Electives, 3

Econ. 144w, The Financial System, 4  
(Econ. 143)  
For. 28w, Logging, 3 (For. 3-4)  
For. 32w, Lumber Distribution, 5 (For.  
33 parallel)  
For. 108w, Uses of Wood II, 3 (For.  
33-34)  
Pol. Sci. 52w, Business Law, 3 (Pol.  
Sci. 51)

*Spring Quarter*

- |  |   |
|--|---|
| Econ. 28f,s, Principles of Accounting, 5<br>(Econ. 3-4 or 5) | Econ. 155s, Corporation Finance, 3<br>(Econ. 143-144) |
| For. 30s, Wood-Seasoning, 3 (For. 33-34)                     | For. 109s, Uses of Wood III, 3 (For.<br>107-108)      |
| Electives, 9   | Pol. Sci. 53s, Business Law, 3 (Pol.<br>Sci. 52)      |
|  | Electives, 7  |

## 3. COURSE IN FOREST BY-PRODUCTS

Suggested for those who wish to enter the field of pulp and paper manufacture, wood distillation, wood preservation, etc. Includes a series of courses in chemistry and a thoro training in the structure, handling, and uses of wood.

## JUNIOR YEAR

## SENIOR YEAR

*Fall Quarter*

- |   |   |
|---|---|
| Agr. Biochem. 2f, Quantitative Methods,<br>5 (Chem. 10 cred.) | Agr. Biochem. 101f, Agricultural Quan-<br>titative Analysis,* 3 (Agr. Biochem. 2<br>and 3 or 7-8) |
| Econ. 85f,s, Principles of Marketing, 3<br>(Econ. 3-4 or 5)   | Agr. Biochem. 111f, Phytochemistry, 3<br>(Biol. 9 cred., organ. chem.)                            |
| For. 33 and 41, see general requirements,<br>page 41          | Agr. Biochem. 113f, Biochemical Lab-<br>oratory Methods, 2 (Quant. Anal.,<br>parallel 111)        |
| For. 39f, Wood Preservation, 3 (For. 33<br>parallel)          | For. 107f, Uses of Wood I, 3 (For.<br>33-34)  |
|   | Electives, 6  |

*Winter Quarter*

- |   |   |
|---|---|
| For. 10w, Forest Mensuration, 5 (For.<br>3-4) | Agr. Biochem. 102w, Agricultural Quan-<br>titative Analysis, 3 (Agr. Biochem.<br>101) |
| Ent. 6, see general requirements, page 41     | Agr. Biochem. 112w, Phytochemistry, 3<br>(Agr. Biochem. 111)                          |
| For. 34, see general requirements, page 41    | Agr. Biochem. 114w, Biochem. Labora-<br>tory Methods, 2 (Agr. Biochem. 113)           |
| Electives, 6                                  | For. 32w, Lumber Distribution, 5 (For.<br>33 parallel)                                |
|   | For. 108w, Uses of Wood II, 3 (For.<br>33-34)   |
|   | Electives, 2  |

*Spring Quarter*

- |  |  |
|--|--|
| Agr. Biochem. 3f,w,s, Types of Carbon<br>Compounds, 6 (Chem. 10 cred.) | For. 109s, Uses of Wood III, 3 (For.<br>107-108) |
| Econ. 28f,s, Principles of Accounting, 5<br>(Econ. 3-4 or 5)           | Electives, 14                                    |
| For. 30s, Wood-Seasoning, 3 (For. 33-34)                               |  |
| Electives, 3   |  |

## 4. LANDSCAPE GARDENING

See suggested course of study on page 33.

## COURSES OF STUDY IN HOME ECONOMICS

The courses of study are designed (a) to prepare women for the responsibilities of citizenship and of home-making; (b) to prepare teachers for the extension of home economics education; (c) to prepare women for vocations which have as their foundation, work of the home economics group.

A number of courses of study are outlined on the following pages. In addition, opportunity is offered through substitutions and selections of electives to prepare for other special fields of work.

The College of Agriculture, Forestry, and Home Economics, and the College of Education coöperate in the preparation of teachers of home economics as outlined in the Teachers' Course in Home Economics, the Teachers' Course in Foods and Home Management, the Teachers' Course in Textiles and Clothing, and the Teachers' Course in Related Art.

The teachers' courses, designed to prepare for the teaching of vocational courses in home economics, are arranged in accordance with the provisions of the Smith-Hughes Act.

The required work of the freshman and the sophomore years is the same in each course of study. Specialization is provided for in the junior and senior years.

(For explanation of terms and course numbers, see page 19.)

### HOME PRACTICE

Home practice in garment-making is required of students who have completed H.E. 11; as a prerequisite to H.E. 13. The character and amount of the home practice work will be arranged with a member of the faculty of the textile and clothing section.

## GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN HOME ECONOMICS

### FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 15 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman year must take precedence in the following year. Registration for from 14 to 16 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 189 credit hours. Freshman lectures. A course of lectures, one hour per week, intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

- Phys. Educ. 1f-2w-3s, Elementary Physical Training. Three hours per week throughout the year.
- Phys. Educ. 4f, Personal Hygiene.
2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequences of continuation courses and the prerequisites must be observed.
- An. Biol. 14f-15w-16s, General Zoology, 9. Bot. 8s, General Botany, 5, may be substituted for An. Biol. 16s.
- Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry Chem. 9-10 successfully will be allowed not more than 10 credits.
- Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 are exempt from this course.
- Farm Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their course of study.
- H. E. 3f,w,s, Textiles, 5
- H. E. 11f,w,s, Garment-Making, 3
- H. E. 51f,w,s, Drawing and Design, 3
- Rhet. 1f,w,s,<sup>1</sup> Rhetoric I, 3
- Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
- Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
- Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

### SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.
- Phys. Educ. 23w, Sophomore Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter.
- Agr. Biochem. 3f,w,s, Types of Carbon Compounds, 6 (Chem. 10 cred.)
- Bact. 1f,w,s, Elementary Bacteriology, 5 (Chem. 10 cred.)
- H. E. 13f,w,s, Dressmaking, 5 (H. E. 3, 11, 51, home practice in garment-making)
- H. E. 21f,w,s, Foods and Cookery, 5 (Chem. 10 cred., Physiol. 4 or parallel.)
- H. E. 22f,w,s, Food Economics, 5 (H. E. 21)
- Physiol. 4f,w,s, Human Physiology, 5 (Chem. 10 cred., Biol. 9 cred.)
- Psychol. 1f-2w, General Psychology, 6
- Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
- Sociol. 1f,w,s, Introduction to Sociology, 3
4. *Electives.*—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high school preparation of each student. Those whose programs permit are advised to register for Rhet. 11, Argumentation, 3, otherwise required in the junior year.

### JUNIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.
- Econ. 5, Principles of Economics, 5
- H. E. 37f,s, Health Care of the Family, 3 (Chem. 5 cred., Bact. 1)

<sup>1</sup> Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 99.

- H. E. 52f,w,s, Art History and Appreciation, 3 (H. E. 51)  
 H. E. 53f,w,s, Advanced Design, 4 (H. E. 51)  
 H. E. Educ. 40f, Child-Training, 3 (Psychol. 1-2)  
 Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, 22 advised) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)  
 2. *Special courses* as prescribed by the curriculum of the line of specialization selected  
 See special requirements on pages 48 to 51.  
 3. *Electives*.—Enough electives should be selected to make, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

## SENIOR YEAR

1. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.  
 H. E. 34f,w,s, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 22, 35 parallel, Econ. 5 or parallel)  
 H. E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, 37, H. E. Educ. 40, or parallel; must parallel H. E. 34)  
 H. E. 45w,s, Home Economics Survey, 2  
 H. E. 131f,w,s, Home Management: House-Planning and Equipment, 5 (52, 53)  
 2. *Special courses* as prescribed by the curriculum of the line of specialization selected.  
 See special requirements on pages 48 to 51.  
 3. *Electives*.—Enough electives should be selected to make, with those listed above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

## GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT LINES OF SPECIALIZATION (SUPPLEMENTARY TO GROUP I)

Students should consult with the faculty of the section in which they have chosen to major, with reference to the elective courses which must be chosen to make up the 189 credit hours required for graduation.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with the regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of one honor point per credit must be maintained for the first two years in order to register for a Senior College elective.

## I. GENERAL COURSE IN HOME ECONOMICS

## JUNIOR YEAR

- H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 1, Agr. Biochem. 3)  
 H. E. 108f,w,s, Nutrition II, 5 (H. E. 23)

## SENIOR YEAR

- Econ. 90s, Economics of Consumption, 3 (Econ. 5)  
 H. E. 17f,w,s, Advanced Clothing Construction, 3 (H. E. 13, 53)  
 H. E. 103f,w,s, Dietetics, 5 (H. E. 108)  
 H. E. 123w,s, Clothing Economics, 2 (H. E. 13, Econ. 5)



## 2. COURSE IN FOODS AND NUTRITION

Those students planning to specialize in foods and nutrition should add the following courses to those listed in the General Course:

## JUNIOR YEAR

- Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)  
 Agr. Biochem. 108s, Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 3) or H. E. 111s, Special Food Problems, 3 (H. E. 105, Agr. Biochem. 2)  
 H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)

## SENIOR YEAR

- H. E. 105f,w, Experimental Cookery, 3 (H. E. 22, 23)  
 H. E. 110s, Special Problems in Dietetics, 3 (H. E. 103)

## 3. COURSE IN TEXTILES AND CLOTHING

Those students planning to specialize in textiles and clothing should register for Advanced Clothing Construction and Clothing Economics in the junior year and add the following courses to those listed in the General Course, omitting Nutrition I, Nutrition II, and Dietetics.

## JUNIOR YEAR

- Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)  
 H. E. 55f,s, Decorative Needlework and Other Crafts, 3 (H. E. 51, 53, or parallel)

## SENIOR YEAR

- H. E. 18w,s, Commercial Clothing Manufacture, 4 (H. E. 17, or parallel)  
 H. E. 58w, Costume Design, 3 (H. E. 55)  
 H. E. 122w,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 2, Econ. 5 or parallel)  
 H. E. 126s, Textile Analysis and Related Problems, 3 (H. E. 122, Agr. Biochem. 2)

## 4. COURSE FOR DIETITIANS

Those students planning to become dietitians may omit the following courses from the General Course: Advanced Clothing Construction, Clothing Economics, Economics of Consumption.

They should add the following courses to those listed in the General Course:

## JUNIOR YEAR

- Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)  
 Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3  
 H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)  
 H. E. Educ. 42f,w,s, Special Methods in Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. Psychol. 55)

## SENIOR YEAR

- H. E. 61f,w,s, Large Quantity Cookery and Marketing, 4 (H. E. 22)  
 H. E. 63f,w,s, Institution Experience, 3 (H. E. 22)  
 H. E. 105f,w, Experimental Cookery, 3 (H. E. 22, 23)  
 H. E. 151s, Institution Management Problems, 4 (H. E. 61, 63)

## 5. COURSE IN INSTITUTION MANAGEMENT

Those students specializing in institution management may omit the following courses from the General Course in Home Economics: Advanced Clothing Construction, Clothing Economics, Economics of Consumption.

They should add the following courses to those listed in the General Course:

## JUNIOR YEAR

Farm Eng. 34w, Household Mechanics and Heat, 4 (Farm Eng. 23 or equiv.)  
H. E. 61f,w,s, Large Quantity Cookery and Marketing, 4 (H. E. 22)  
H. E. 63f,w,s, Institution Experience, 3 (H. E. 22)

## SENIOR YEAR

Econ. 85f,s, Principles of Marketing, 3 (Econ. 5)  
Econ. 28f,s, Principles of Accounting, 5 (Econ. 5)  
H. E. 105f,w, Experimental Cookery, 3 (H. E. 22, 23)  
H. E. 151s, Institution Management Problems, 4 (H. E. 61, 63)

## 6. COURSE IN EXTENSION WORK

Students planning to become home economics extension workers should add the following courses to those listed in the General Course:

## JUNIOR YEAR

Ent. 20w, Home Economics Entomology, 3 (An. Biol. 6 cred.)  
Farm Eng. 34w, Household Mechanics and Heat, 4 (Farm Eng. 23 or equiv.)  
Farm Eng. 35s, Household Electricity and Light, 4 (Farm Eng. 34)  
H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. Psychol. 55)

## SENIOR YEAR

H. E. 44s, Methods in Home Economics Extension Work, 3 (H. E. Educ. 42)  
H. E. 110s, Special Problems in Dietetics, 3 (H. E. 103)

## COURSES FOR TEACHERS

(College of Education)<sup>1</sup>

## 7. TEACHERS' COURSE IN HOME ECONOMICS

Students specializing in this course must complete the required work of the General Course in Home Economics and in addition the following professional subjects:

## JUNIOR YEAR

Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3  
Hist. and Philos. of Educ. 5s, Public Education in the U. S., 3 (Psychol. 1-2)  
H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Educ. Psychol. 55 or Agr. Educ. 11)

## SENIOR YEAR

H. E. Educ. 49f,w, Observation and Teaching, 8 (H. E. Educ. 42)

<sup>1</sup> See scholarship requirements for Admission of the College of Education, page 17.

## 8. TEACHERS' COURSE IN FOODS AND HOME MANAGEMENT

Students specializing in this course must complete the required work of the course in foods and nutrition and in addition the following professional subjects:

## JUNIOR YEAR

Hist. and Philos. of Educ. 5s, Public Education in the U. S., 3 (Psychol. 1-2)  
 H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ., 11 or Educ. Psychol. 55)  
 Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3

## SENIOR YEAR

H. E. Educ. 47f,w, Observation and Teaching, 8 (H. E. Educ. 42, H. E. 34, 35)

## 9. TEACHERS' COURSE IN TEXTILES AND CLOTHING

Students specializing in this course must complete the required work of the course in textiles and clothing with the exception of Textile Analysis and Related Problems, and in addition the following professional subjects:

## JUNIOR YEAR

Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3  
 Hist. and Philos. of Educ. 5s, Public Education in the U. S., 3 (Psychol. 1-2)  
 H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. Psychol. 55)

## SENIOR YEAR

H. E. Educ. 48f,w, Observation and Teaching, 8 (H. E. Educ. 42)

## 10. TEACHERS' COURSES IN RELATED ART

Students specializing in the teaching of related art may omit the following courses from the General Course and the Teachers' Course in Textiles and Clothing: Economics of Consumption, Commercial Clothing Manufacture, Advanced Textiles, Observation and Teaching: Textiles and Clothing.

They should add the following courses:

## JUNIOR YEAR

Art Educ. 32C,f-33C,w-34C,s, Sketch; or 32A,f-33A,w-34A,s, Still Life, 6  
 H. E. 58s, Costume Design, 3 (H. E. 55)

## SENIOR YEAR

Art Educ. 43C,f; 44C,w; 45C,s, Sketch, 3 (Art Educ. 32C, 33C, 34C)  
 H. E. 54s, Interior Design, 3 (H. E. 52, 53, 131)  
 H. E. 57w, Weaving and Other Crafts, 3 (H. E. 3, 51, 53)  
 H. E. Educ. 43w, Organization and Methods for Related Art Teaching, 3 (H. E. 52, 53, H. E. Educ. 42)

## DESCRIPTION OF COURSES

### AGRICULTURAL BIOCHEMISTRY

Professors ROSS A. GORTNER, CLYDE H. BAILEY; Associate Professor LEROY S. PALMER; Assistant Professors CORNELIA KENNEDY, CLARENCE A. MORROW, JOHN J. WILLAMAN; Instructors ARTHUR K. ANDERSON, PAUL F. SHARP.

*General statement.*—This division offers two types of work, namely, courses in those phases of chemistry which have special application in agriculture or home economics for students whose major work is in other divisions; and courses designed to train chemists for research or instruction in the special field of agricultural biochemistry.

#### COURSES

2. QUANTITATIVE METHODS. Principles of quantitative analysis, including stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations. MR. WILLAMAN.
3. TYPES OF CARBON COMPOUNDS. The groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. MR. ANDERSON
- 7-8. GENERAL AGRICULTURAL BIOCHEMISTRY. A qualitative and quantitative study of the types of organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. Lecture and laboratory. MR. ANDERSON.
15. PRINCIPLES OF ANIMAL NUTRITION. Lectures, recitations, and collateral reading emphasizing the chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamine hypothesis, and deficiency diseases. MR. PALMER.
- 101-102. AGRICULTURAL QUANTITATIVE ANALYSIS. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MR. MORROW.
103. DAIRY CHEMISTRY. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, the chemistry of the various constituents of milk and of the processes involved in the manufacture of dairy products. MR. PALMER.
106. CHEMICAL TECHNOLOGY OF AGRICULTURAL PRODUCTS. The composition of the principal products and by-products of agriculture and their utilization as raw material in various industries, and the methods of chemical control work in these industries. MR. BAILEY.

108. CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food. MR. BAILEY.
109. SELECTED FLOUR LABORATORY METHODS. A laboratory course in which particular attention is given to recently developed methods for testing wheat products. Less extensive than 110. Designed for men with commercial laboratory experience. (Not open to students who have credit in Course 110.) MR. BAILEY.
110. FLOUR LABORATORY METHODS. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. (Not open to students who have credit in Course 109.) MR. BAILEY.
- 111-112. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physicochemical relations to the vital processes involved in growth and nutrition. MR. MORROW.
- 113-114. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MR. MORROW, MR. SHARP.
116. ADVANCED ANIMAL NUTRITION. Lectures and assigned readings on recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamins, and the relation of nutrition to disease. MR. PALMER, MISS KENNEDY.
117. LABORATORY PROBLEMS IN ANIMAL NUTRITION. A laboratory course on methods used in nutrition studies through assisting in investigations under way or carrying out independent studies under the direction of the instructors. MR. PALMER, MISS KENNEDY.
118. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products. MR. GORTNER, MR. BAILEY, MR. PALMER, MR. MORROW, MR. WILLAMAN.

## AGRICULTURAL ECONOMICS

See Economics (page 68).



## AGRICULTURAL EDUCATION

## COLLEGE OF EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professors WILLIAM P. DYER, ALBERT M. FIELD, FRANK W. LATHROP; Instructor SHERMAN DICKINSON; Extension Specialists THEODORE A. ERICKSON, GEORGE F. HOWARD, FRANK W. PECK.

## COURSES

11. PRINCIPLES OF VOCATIONAL EDUCATION. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education. MR. DYER.
21. VOCATIONAL EDUCATION. A short history of vocational education; present status in Europe and the United States; manual training and home arts in an educational system; place of agriculture in the public schools with special reference to Minnesota. MR. MAYNE.
41. APPRENTICE TEACHING. An introductory course in teaching, including observation of class work, apprentice teaching, and special conference discussions of problems relating to teaching. Intended to initiate the student into the routine of classroom procedure. Professional readings. MR. FIELD, MR. LATHROP, MR. DICKINSON.
42. TEACHING. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings. MR. FIELD, MR. LATHROP, MR. DICKINSON.
- 63-64-65. GENERAL AGRICULTURE. For students majoring in such fields of work as agricultural biochemistry, entomology, and economic zoology, plant pathology, and in other colleges. A series of units by division chiefs and other agricultural specialists. MR. STORM, MR. MAYNE.
75. VISUAL PRESENTATION. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assist in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums. MR. DICKINSON.
81. EXTENSION WORK. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work of Minnesota. MR. STORM, MR. PECK.
82. AGRICULTURAL EXTENSION FIELD WORK. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter. MR. STORM, MR. PECK.

121. **TEACHERS' COURSE, HOME AND SCHOOL GARDENING.** A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens. MR. FIELD.
131. **METHODS IN TEACHING HIGH SCHOOL AGRICULTURE.** Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture. MR. FIELD.
151. **ORGANIZATION AND MANAGEMENT.** Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coordination of work. MR. STORM, MR. DYER, MR. LATHROP.
153. **CONSOLIDATED RURAL SCHOOLS.** To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work. MR. DYER.
154. **RURAL EDUCATION AND COMMUNITY LIFE.** The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life. MR. DYER.
155. **CONSOLIDATED RURAL SCHOOL PROBLEMS.** Opportunity for intensive study and research in special problems of administration and supervision and village and consolidated rural schools. MR. DYER.
- 161-162-163. **FUNDAMENTALS OF AGRICULTURE.** Essential for principals and superintendents of schools in which agriculture is taught, and valuable for students of other colleges whose time for agriculture is limited. Agricultural college experts will give work in their special fields. MR. STORM.
164. **FUNDAMENTALS OF AGRICULTURE.** Basic principles of agricultural science and elements of practical agriculture. Emphasis on concrete problems in soils, crops, and animal husbandry, as related to classroom instruction and to school and home projects. For consolidated school principals. MR. FIELD.
176. **ADVANCED VISUAL PRESENTATION.** Continuation of 75. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation. MR. DICKINSON.
181. **AGRICULTURAL STATISTICS AND GRAPHIC REPRESENTATION.** Course teaches application of statistical methods to agriculture and different means of representing agricultural statistics graphically. Of value to

all students to enable them to interpret, present, and use agricultural statistics and graphic representations.

- 191-192-193. SEMINAR IN AGRICULTURAL EDUCATION. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature. MR. STORM, MR. DYER, MR. FIELD, MR. LATHROP.

## AGRONOMY AND FARM MANAGEMENT

Professors ANDREW BOSS, HERBERT K. HAYES; Associate Professors ALBERT C. ARNY, LOUIS B. BASSETT; Assistant Professors LOUIS F. GAREY, FORREST W. MCGINNIS, GEORGE A. POND; Instructors FRED W. GRIFFEE, FERDINAND H. STEINMETZ; Extension Specialists WILLIAM L. CAVERT, RALPH F. CRIM.

### COURSES

- I. FARM CROPS. The important field crops of the United States with emphasis upon those of local importance; distribution, economic importance, agricultural classification, cultural methods, and principles of improvement and seed selection. MR. STEINMETZ.
- II. FARM MACHINERY. Lectures and laboratory work covering classification, mechanical construction, adjustment, and operation of the different kinds of farm machinery. MR. BASSETT.
101. FARM MANAGEMENT I. Farm records—simple farm accounting and the forms and methods employed in making cost of production studies and farm management surveys. Practice in record-keeping and accounting. MR. POND.
102. FARM MANAGEMENT II: ORGANIZATION. The business side of farming is emphasized. Special attention is given to farm organization and equipment. MR. BOSS, MR. GAREY.
103. FARM MANAGEMENT II: OPERATION. Continuation of 102. Special attention is given to farm operation. MR. BOSS, MR. GAREY.
104. FARM MANAGEMENT III. An advanced seminar course, including cost of production studies, farm business analyses, and farm practices. MR. BOSS.
121. CEREAL CROPS. An advanced study of the cereal crops. Structure, group classifications, improvement, growing, and utilization. Brief score card practice and a limited amount of placing on intrinsic value included. MR. MCGINNIS.
122. CORN AND POTATO CROPS. Corn and potato crops similar to that outlined for Course 121. MR. MCGINNIS.
123. FORAGE AND FIBER CROPS. A study of forage plants through assigned reading, laboratory and field work. Following the study of each crop

some attention is given to score card practice and comparative placing of representative samples. MR. ARNY, MR. STEINMETZ.

131. PRINCIPLES OF GENETICS. Fundamental principles of breeding, heredity, variation, biometry, and evolution. Same as Hort. 109. MR. GRIFFEE, MR. BEAUMONT.
132. FARM CROPS PLANT-BREEDING. Applied genetics. Methods of breeding each of the important agricultural crops. MR. HAYES, MR. GRIFFEE.
133. JUDGING AND GRADING FARM CROPS. Experimental evidence regarding the factors which determine the market value of the crops as a basis for judging and grading work. MR. ARNY.

## ANIMAL BIOLOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, HAL DOWNEY, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. OESTLUND.

*General statement.*—Courses in this department are closely correlated with those offered by the Division of Entomology and Economic Zoology of the College of Agriculture, Forestry, and Home Economics. For courses of that division, see page 73.

Credit is given for acceptable work done at any approved seaside laboratory.

### COURSES

- 9-10. HISTOLOGY. A comparative microscopic study of the origin and structure of the tissue of vertebrates and invertebrates, and of the organs of mammals. It is advisable to complete the year with Course 11. Textbook, lectures, and laboratory. MR. DOWNEY.
11. CYTOLOGY AND TECHNIQUE. The structure and properties of the animal cell and the elements of microscopical technique. Lectures, reference and laboratory work. MR. NACHTRIEB.
- 14-15-16. GENERAL ZOOLOGY. Same as Course 1-2 extended throughout three quarters. MR. SIGERFOOS, MR. RILEY.
17. GENERAL PHYSIOLOGY I. Physical and chemical properties of living protoplasm and cells. Rôle of diffusion, osmotic pressure, and ions in cell physiology. Permeability. An introduction to the application of physical chemistry to cell processes. Lectures, laboratory, and assigned reading. MR. LUND.
18. GENERAL PHYSIOLOGY II. Comparative physiology of respiration, nutrition, and growth. The nature of the production of movement, heat, light, and electricity of organisms. Lectures, laboratory, and assigned reading. MR. LUND.

19. PRINCIPLES OF ANIMAL BEHAVIOR. The nature of the process of stimulation. Comparative physiology of the nervous system and sense organs of lower organisms and reactions of lower organisms to stimuli. Lectures, laboratory, and assigned reading. MR. LUND.
- 37-38-39. GENERAL ENTOMOLOGY. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. MR. OESTLUND.
44. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and the structure, life history, and economic relations of representative parasites. Methods of control and prevention will be emphasized. MR. RILEY.
45. RELATIONS OF INSECTS TO DISEASE. The causation and transmission of disease by insects and other arthropods. Life history, habits, and methods of control of hominnoxious species. MR. RILEY.
- 46-47. ORNITHOLOGY. Structure, classification, and habits of birds with special reference to the birds of Minnesota. Considerable time devoted to field study. Bird or field glass and handbook required. Laboratory, lectures, and quizzes. Class limited to ten. MR. ROBERTS.
48. GENERAL ECOLOGY. A general course covering the relationships of animals, animal societies, and faunas to the inorganic and organic factors of the environment. The course consists of lectures, assigned reading, recitations; laboratory and field work. MR. CHAPMAN.
107. PROTOZOOLOGY. Lectures, reference and laboratory work on the structures and life histories of Protozoa, with special reference to the relation of the Protozoa to diseases of animals. MR. SIGERFOOS.
- 109-110-111. GENERAL PHYSIOLOGY. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. MR. LUND.
- 117-118-119. ECOLOGY OF INSECTS. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. MR. CHAPMAN.
124. ADVANCED ECOLOGY. Similar to 117-118-119 with special field work. MR. CHAPMAN.
- 125-126-127. ADVANCED ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects, with lectures on the history of entomology. MR. OESTLUND.
130. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the Aphididae. MR. OESTLUND.



- 139-140. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. MR. RILEY.
- 144-145-146. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. Origin and biological significance of parasitism, structure, life history, and economic relations of representative parasites. Second quarter devoted primarily to the relation of insects to diseases of man and animals. MR. RILEY.
- 181-182. EMBRYOLOGY. A survey of the principles of animal development and a detailed study of the development of the circulatory or urino-genital system of a vertebrate. Lectures, reference and laboratory work. MR. NACHTRIEB.
183. GENETICS AND EUGENICS. Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of the race. Lectures, references, quizzes, and demonstrations. MR. NACHTRIEB.

## ANTHROPOLOGY AND AMERICANIZATION TRAINING

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor ALBERT E. JENKS; Instructor GLADYS SPEAKER.

### COURSES

1. INTRODUCTION TO ANTHROPOLOGY. Origin and development of human societies; various agencies which have determined type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. MR. JENKS.
4. CULTURAL ANTHROPOLOGY. Origin and early development, of the most important activities and institutions which had their beginning among primitive men. MR. JENKS.
5. GENERAL IMMIGRATION. Facts of recent world migration. Chief causes of emigration from the old nests, and of immigration to the United States; federal and state problems of immigrant legislation, control, and distribution.
12. ETHNOLOGY. The different so-called races of men; their historical classifications; determinance of ethnic types; important ethnic problems. MISS SPEAKER.
108. PHILIPPINE PEOPLES. Comparative study of the four large ethnic and cultural groups of people; policy of insular government affecting American home interests in the Orient. MR. JENKS.
112. THE AMERICAN NEGRO. Development of the American negro; his characteristics, conditions, and developing tendencies; negro and immigration adjustments. MR. JENKS.

113. THE AMERICAN PEOPLE. OLDER IMMIGRANTS. Characteristics, contributions, and distribution of the older immigrant peoples in America, their modification and importance to us. MR. JENKS.
114. THE AMERICAN PEOPLE. NEWER IMMIGRANTS. Characteristics, contributions, and distribution of the newer immigrant peoples in America, their modification and importance to us. MR. JENKS.
115. THE AMERICAN PEOPLE. AMERICANISMS AND ASSIMILATIONS. Essential and unique historical Americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. MR. JENKS.
117. THE IMMIGRANT WOMAN. The peculiar problems of the woman immigrant in personal service, in industrial groups, in the home, and out of regular employment. MISS SPEAKER.
118. GOVERNMENT AND THE IMMIGRANT. Legal and administrative aspects of Americanization. Federal and state laws affecting immigration, citizenship, and naturalization; practical administration of these laws through governmental agencies; political experiences of the foreign-born.
120. THE AMERICAN INDIAN. Origin and migrations of the Indian. Basic material for study of origin and spread of indigenous cultures.
- 123-124. PROBLEMS IN ANTHROPOLOGY. An advanced course of method and independent research. MR. JENKS.

## ANIMAL HUSBANDRY

### ANIMAL INDUSTRY GROUP

Professors WALTER H. PETERS, EVAN F. FERRIN; Assistant Professors PHILIP A. ANDERSON, NORRIS K. CARNES; Instructor ALFRED L. HARVEY; Extension Specialists KENNETH F. WARNER, HENRY G. ZAVORAL.

### COURSES

2. LIVESTOCK-JUDGING. Practice in judging horses, cattle, sheep, and hogs from both the type and the breed standpoint. MR. ANDERSON.
- 3-4. MARKET CLASSES OF LIVESTOCK. Livestock markets and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock. (Not offered after 1922-23.) MR. FERRIN.
5. LIVESTOCK-BREEDING. The application of the principles of genetics to the breeding of livestock; a review of the master-breeders' methods and consideration of the practical breeders' problems. MR. PETERS.
6. LIVESTOCK-FEEDING. Feeding livestock under farm conditions; efficiency and economy in growing and fattening meat animals; feeding draft

horses and colts. Consideration of experimental work and present practice. Practical feeding problems. Only three credits allowed to those who have completed Course 8. MR. FERRIN.

7. MEATS. Dressing of animals and the cutting of carcasses. Lectures and laboratory work. MR. ANDERSON.
8. ELEMENTS OF FEEDING. Brief survey of livestock and dairy feeding designed for students not majoring in animal industry. Not open to those who have completed Course 6 or Dy. Husb. 103. MR. RAYBURN, MR. HARVEY.
9. PEDIGREES AND HERD BOOKS. Pedigree registration; laboratory practice in the use of the stud, herd, and flock records; tracing and tabulating pedigrees. MR. FERRIN.
10. MARKET CLASSES OF LIVESTOCK. Livestock markets and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock. MR. FERRIN.
- 11-12. TYPES AND BREEDS OF LIVESTOCK. The types as related to performance or production in horses, beef cattle, sheep, and swine, and the origin, history, characteristics, and economic importance of the breeds, classified according to type. (Not offered in 1922-23.) MR. CARNES.
101. ADVANCED STOCK-JUDGING. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms. MR. FERRIN.
102. HORSE HUSBANDRY. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horsepower; factors determining a horse's efficiency for work. MR. PETERS.
103. BEEF CATTLE HUSBANDRY. The management of pure blood and grade herds; selection of foundation stock, sales and shows, building equipment, labor. Practicums in fitting cattle for show and sale, animal photography, preparation of feeds, and the care of cattle. MR. CARNES.
104. SHEEP HUSBANDRY. The care and management of purebred sheep. Stud of pedigrees, registrations, fitting for show purposes, marketing. Practicums in feeding, shearing, blocking, and caring for young lambs. MR. ANDERSON.
105. SWINE HUSBANDRY. Hog farm equipment, purebred vs. market hogs; building a breeding herd, private herd records, herd management, fitting and showing, marketing breeding stock. Barn work and feeding practice. MR. FERRIN.
106. ADVANCED MEATS. Practice work in dressing animals and cutting carcasses giving particular attention to conformation as related to dressing percentage and the carcass; also a study of the physical and chemical composition of meat. MR. ANDERSON.

107. MEAT PROBLEMS. The wholesale cuts and grades of meat; the packing industry and the utilization of by-products. Special problems and trips to packing establishments. MR. ANDERSON.
108. SEMINAR. Special problems and review of investigations pertaining to the livestock industry. MR. PETERS.

## ARCHITECTURE

### COLLEGE OF ENGINEERING AND ARCHITECTURE

Instructor CARL E. JOHNSON.

- 21-22-23. ELEMENTARY FREE-HAND DRAWING. Free-hand perspective. Drawing with charcoal, pencil, and color from architectural ornament and details of the figure. MR. JOHNSON.

## ART EDUCATION

### COLLEGE OF EDUCATION

Assistant Professor RUTH RAYMOND; Instructors LEAH M. HANLEY, HAZEL S. MARTIN.

#### COURSES

- 29-30-31. FUNDAMENTAL PRINCIPLES OF DESIGN. MISS RAYMOND.
- 32-33-34. FREE-HAND DRAWING AND COMPOSITION. MISS RAYMOND, MRS. HANLEY, MRS. MARTIN.
- 40-41-42. PRINCIPLES OF HARMONY IN FORM AND COLOR. MISS RAYMOND.

## BACTERIOLOGY AND IMMUNOLOGY

### MEDICAL SCHOOL

Professor WINFORD P. LARSON; Associate Professor ARTHUR T. HENRICI; Instructors ANNE G. BENTON, ROBERT G. GREEN, DAVID O. SPRIESTERSBACH.

#### COURSES

- I. GENERAL BACTERIOLOGY. Lecture and laboratory course. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. DR. LARSON, MISS BENTON, MR. GREEN, MR. SPRIESTERSBACH.
103. SPECIAL BACTERIOLOGY FOR STUDENTS OF AGRICULTURE. Bacteriology of the soil in relation to fertility; the nitrogen-fixing bacteria of legumes; bacteria that cause plant diseases; bacterial diseases of domestic animals; the bacteriology of milk and dairying. DR. HENRICI.
105. HOUSEHOLD BACTERIOLOGY. The decay, fermentation, and putrefaction of foodstuffs; molds; canning; bacterial food-poisoning; bacteriology of the cleansing processes. MISS BENTON,

## BEE CULTURE

Professor FRANCIS JAGER.

*General statement.*—Scientific and practical instruction on bees, bee practice, and bee industry.

Students registering for beekeeping should have a working knowledge of botany, zoology, and entomology. If not, they should take courses in those fields parallel with beekeeping.

## COURSES

1. ELEMENTARY BEE SCIENCE. Classification, structure of *Apis Mellifica*. Life history of the queen, worker, and drone. Organization of the colony. Colony instincts and activities. Nutrition of the bee. Food sources. Diseases and enemies. MR. JAGER.
2. INDUSTRIAL BEEKEEPING. Bees as honey producers and pollinators. Beehives, tools, and appliances. Bee shop. Location. Handling bees; commercial management of bees. Production of comb and extracted honey. Increase. Accounting and marketing. MR. JAGER.
3. ADVANCED BEEKEEPING. Outfit for a professional apiary. Location and management of outapiaries. Migratory beekeeping. Transportation. Bee workshop. Central extracting plant. Power and machinery. Economical feeding. Wax-rendering. Professional disease treatment. Organization. MR. JAGER.
4. QUEEN-RAISING. Principles of reproduction. Queen- and drone-judging. Production of virgin queens and drones. Building of nuclei. Mating. Mailing, introducing, and requeening. In connection with the University Farm queen-raising project. Theory of queen-breeding. MR. JAGER.
5. BEE DISEASES. Fungi and parasites. Brood and mature bee diseases. Their diagnosis, causes, and practical treatment. Bee inspection. MR. JAGER.
6. STUDY OF HONEY. Analysis, purity of honey, specific gravity, granulation. Influence of weather, soil, etc., on quality and color of honey. Honey-judging, by taste and color. Wax, vinegar, and other by-products. MR. JAGER.

## BOTANY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professors FREDERIC K. BUTTERS, RODNEY B. HARVEY; Assistant Professors WILLIAM S. COOPER, NED L. HUFF; Instructors CHARLES L. FARABAUGH, ARTHUR M. JOHNSON.



## COURSES

- 1-2. GENERAL BOTANY. MR. DURAND, MR. BUTTERS, MR. HUFF, MR. JOHNSON, and assistants.
- 4-5-6. GENERAL BOTANY. Same as Course 1-2, extended throughout three quarters. For students in agriculture and forestry only. MR. DURAND.
7. TAXONOMY OF FLOWERING PLANTS. A general study of the classification and relationships of flowering plants. MR. ROSENDAHL, MR. JOHNSON.
8. GENERAL BOTANY. A course adapted to the needs of students in home economics. MR. DURAND.
12. GENERAL MORPHOLOGY OF ALGAE. MISS TILDEN.
13. GENERAL MORPHOLOGY OF FUNGI. MR. JOHNSON.
20. FOREST ECOLOGY. Relation between forest trees and their environment; soil and atmospheric factors, their influence upon function, structure, and distribution; forest communities and successions. MR. COOPER.
21. ELEMENTARY ECOLOGY. The study of plants in relation to their environment. MR. COOPER.
22. ELEMENTARY PLANT PHYSIOLOGY. General survey of plant functions. MR. KNIGHT, MR. HARVEY, MR. FARABAUGH.
48. PLANT INDUSTRY. Lecture demonstration course on relation of plants to modern important industries and conservation policies. Especially for students in arts and the professions. Given with the coöperation of special lectures from the departments of the Plant Science Group. MR. ROSENDAHL, MR. FREEMAN, and special lecturers.
51. HISTOLOGICAL METHODS. Training in technique of preparing plant material for microscopic study. MR. ROSENDAHL.
62. GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES. Structure, evolution, and classification of the liverworts, mosses, and ferns. MR. HUFF.
63. GENERAL MORPHOLOGY OF ANGIOSPERMS AND GYMNASPERMS. Structure, evolution, and classification of seed plants. MR. BUTTERS.
107. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. Structure and classification of the liverworts, and mosses. MR. DURAND.
108. MORPHOLOGY AND TAXONOMY OF PTERIDOPHYTES. An intensive study of lycopods, ferns, and their allies; their structure, history, and classification. MR. BUTTERS.
110. MORPHOLOGY AND TAXONOMY OF GYMNASPERMS. An intensive study of cycads, conifers, and their allies; their structure, history, and classification. MR. BUTTERS.

- 113-114-115. **ADVANCED TAXONOMY.** Special attention is given to the taxonomy of difficult natural groups of angiosperms, involving systematic principles and practice, rules of nomenclature, and systems of classification. MR. ROSENDAHL.
118. **CYTOLOGY.** Origin, development, structure, and functions of the plant cell and its various constituents. MR. ROSENDAHL.
127. **ANATOMY OF VASCULAR PLANTS.** Microscopic structure of vascular plants with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. MR. BUTTERS.
131. **FIELD ECOLOGY.** A survey of the local plant communities and successions followed by a written report, and by a study of the general principles of plant association and succession. MR. COOPER.
132. **ECOLOGICAL ANATOMY.** The individual plant and its parts as related to environment; special plant forms and structures, their causes and significance. MR. COOPER.
133. **FOREST GEOGRAPHY OF NORTH AMERICA.** Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America. MR. COOPER.
141. **PHYSICAL PHASES OF PLANT PHYSIOLOGY.** The intake and translocation of materials, and the energy relations of the plant. MR. KNIGHT, MR. HARVEY, MR. FARABAUGH.
142. **PLANT METABOLISM.** The synthesis of plant food, its transformation and utilization by the plant. MR. KNIGHT, MR. HARVEY, MR. FARABAUGH.
143. **PLANT METABOLISM AND GROWTH.** A continuation of Course 142, dealing with respiration, growth, and movement. MR. HARVEY, MR. KNIGHT, MR. FARABAUGH.
144. **PLANT MICROCHEMISTRY.** Localization of materials of physiological importance in the plant and their relation to physiological processes. MR. HARVEY.

## CHEMISTRY

### THE SCHOOL OF CHEMISTRY

Professors WILLIAM H. HUNTER, CHARLES F. SIDENER; Associate Professors FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professors ISAAC W. GEIGER, LLOYD H. REYERSON; Instructor WALTER M. LAUER.

### COURSES

- 1-2-3. **GENERAL INORGANIC CHEMISTRY.** 1-2—General laws of chemistry and of the non-metals and their compounds. 3—Metals and their compounds. MR. SNEED.

- 9-10. GENERAL INORGANIC CHEMISTRY. 9—General laws of chemistry; the non-metals and their compounds. 10—Metals and their compounds and ionic equilibrium, considered quantitatively. MR. REYERSON.
11. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. MR. SNEED.
- 12-13. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. MR. SNEED.
- 20-21. QUANTITATIVE ANALYSIS. General principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. MR. SIDENER, MR. GEIGER.
- 35-36. ORGANIC CHEMISTRY. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. MR. HUNTER, MR. LAUER.
- 140-141-142. PHYSICAL CHEMISTRY. A general survey of the subject. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MR. MACDOUGALL.

## CIVIL ENGINEERING

### COLLEGE OF ENGINEERING AND ARCHITECTURE

Professor FREDERIC H. BASS.

#### COURSE

53. MUNICIPAL ENGINEERING. Development of municipal public works. City planning, transportation, and housing. The principles of public health and sanitation. Public water supplies, sewerage and sewage disposal. Refuse collection and disposal. The sanitation of buildings. MR. BASS.

## DAIRY HUSBANDRY

### ANIMAL INDUSTRY GROUP

Professors CLARENCE H. ECKLES, JOSEPH R. KEITHLEY; Professor Emeritus THEOPHILUS L. HAECKER; Assistant Professors HAROLD MACY, ALLAN B. RAYBURN; Instructors CHESTER D. DAHLE, THOR W. GULLICKSON; Assistants ELMER O. ANDERSON, CARL F. HUFFMAN; Extension Specialists EDWIN A. HANSON, ARTHUR J. MCGUIRE, LESLIE V. WILSON.

## COURSES

1. ELEMENTS OF DAIRYING. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream-separating and farm butter-making. MR. KEITHLEY, MR. DAHLE, MR. GULLICKSON, MR. ANDERSON, MR. HUFFMAN.
2. DAIRY BACTERIOLOGY. Lectures and laboratory exercises. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of dairy products. MR. MACY.
4. CHEESE FACTORY PRACTICE. A minimum of one month's experience in an approved practical cheese factory. Records are kept and reports made. MR. KEITHLEY.
5. CREAMERY PRACTICE. A minimum of one month's experience in an approved practical creamery. Records are kept and a report made. MR. KEITHLEY.
6. JUDGING DAIRY CATTLE. Comparative judging of dairy cattle and study of breed types. Recommended to be taken parallel to 101. MR. RAYBURN.
101. MILK PRODUCTION. Problems of the dairy farmer, such as characteristics and adaptations of dairy breeds; selection and management of dairy herd and sire; calf-raising; dairy barns. MR. ECKLES.
102. MARKET MILK. Lectures and laboratory work. Classes of market milk; transportation and marketing; sanitary inspection; equipment of plants; problems of public control. Standardization. Pasteurization. Reconstitution. Accounting. MR. KEITHLEY, MR. MACY.
103. DAIRY STOCK-FEEDING. Application of principles of nutrition to feeding the dairy cow and growing young animals. Feeding standards; characteristics of various feeding stuffs; formation of rations. MR. ECKLES.
104. ADVANCED STUDY OF DAIRY BREEDS. Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to purebred herds. MR. RAYBURN.
105. SEMINAR I. Special investigation and study of selected topics. Each student presents papers and reports on assigned subjects and reviews recent scientific investigations along dairy husbandry lines. MR. ECKLES.
106. SEMINAR II. Continuation of 105, but 105 not a prerequisite. MR. ECKLES.
107. SEMINAR III. Continuation of 106, but 106 not a prerequisite. MR. ECKLES.

111. DAIRY PRODUCTS I. The manufacture of butter and ice cream with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, operation, and accounting in such factories. Laboratory exercises to illustrate these processes. MR. KEITHLEY, MR. DAHLE.
112. DAIRY PRODUCTS II. The manufacture of cheese, condensed milk, and milk powder with special reference to the chemical, bacteriological, and physical processes involved. Organization, construction, equipment, operation, and accounting in such factories. Laboratory exercises and lectures to illustrate principles of these processes. MR. KEITHLEY, MR. DAHLE.

## ECONOMICS

### SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY; Associate Professors FREDERIC B. GARVER, BRUCE D. MUDGETT; Assistant Professors ERNEST A. HEILMAN, HOWARD S. NOBLE, H. BRUCE PRICE, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON,<sup>1</sup> CLAUD F. CLAYTON, JOSEPH E. CUMMINGS, BUDD A. HOLT, PAUL L. MILLER, WARREN C. WAITE, VIRGIL R. WERTZ.

5. PRINCIPLES OF ECONOMICS. (For agriculture, forestry, and home economics students.) MR. WORKING, MR. CLAYTON, MR. HOLT, MR. WERTZ.
6. AGRICULTURAL ECONOMICS. MR. WORKING, MR. WAITE.
13. AGRICULTURAL STATISTICS. Statistical method applied to agricultural data. MR. WORKING.
20. ECONOMIC GEOGRAPHY OF AGRICULTURE. The localization of agricultural products, markets and systems of farming; economic and other forces determining this localization; considered in relation to industries in general. MR. BLACK, MR. CLAYTON.
21. ECONOMIC HISTORY OF AGRICULTURE. The evolution of the economic organization with special reference to agriculture. The development of methods of agricultural production and marketing, types of farming, and tenure systems. MR. PRICE.
- 25-26. PRINCIPLES OF ACCOUNTING. MR. NOBLE.
28. PRINCIPLES OF ACCOUNTING. (For agriculture, forestry, and home economics students.) MR. HEILMAN, MR. MILLER.

<sup>1</sup> Leave of absence, 1922-23.



50. FARM FINANCE. The financial needs of typical farmers. Present facilities for supplying them; institutions, their organization and operation, interest rates, defects, and proposed remedies. The financing of the various farm organizations. The farmer as an investor. MR. DOWRIE.
72. ECONOMICS OF TRANSPORTATION. MR. CUMMINGS.
73. RAILWAY TRAFFIC AND RATES. MR. CUMMINGS.
85. PRINCIPLES OF MARKETING. Analysis of market functions, marketing channels, and marketing agencies. Market price and market costs. MR. PRICE, MR. ANDERSON.
90. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. MR. GARVER.
91. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. Administration of business enterprises; coördination of men and departments; delegation of authority; planning; production control; scientific management.
- 103-104. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rent, and profits. Assigned readings and reports on current problems in distribution. MR. GARVER.
106. LAND ECONOMICS. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange. MR. BLACK.
107. LAND TENURE. Property in land; tenancy; farm labor; evolution of the tenure classes. MR. BLACK.
108. MARKETING OF FARM PRODUCTS. Studies of the problems and methods of marketing selected farm products with special reference to the Twin City markets. MR. PRICE, MR. ANDERSON.
- 110-111. PRACTICE COURSE IN MARKETING. Eight to twelve weeks of experience as an employee in central or local markets. Careful study and observation of methods. Written plans and reports. MR. PRICE, MR. ANDERSON.
112. BUSINESS STATISTICS. The use of statistics in the analysis of the internal operations of a business and of external business conditions. MR. MUDGETT.
113. THEORY OF STATISTICS. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and of correlation, partial correlation; and the theory of errors. MR. MUDGETT.

116. **ECONOMICS OF AGRICULTURAL PRODUCTION.** Detailed analysis of the economic principles underlying agricultural production; the relation of value and price to combinations of factors of production and selection of enterprises. MR. BLACK.
117. **PRICES OF FARM PRODUCTS.** Description, analysis, and criticism of the way in which prices of farm products are determined in the various markets. MR. WORKING.
126. **PRINCIPLES OF COÖPERATION.** The coöperative mode of economic functioning as compared with the competitive and governmental, as to motivation, organization, and public control; applied to agricultural marketing, finance, production, and consumption. MR. BLACK, MR. MILLER.
- 127-128. **MARKETING ORGANIZATION AND MANAGEMENT.** Principles of accounting and business organization applied to the organization and management of proprietary and coöperative marketing business units. MR. BLACK, MR. MILLER.
131. **COST ACCOUNTING.** MR. NOBLE.
- 143-144. **THE FINANCIAL SYSTEM.** MR. DOWRIE, MR. STEHMAN, MR. EBERSOLE.
145. **FOREIGN EXCHANGE.** MR. DOWRIE.
149. **BUSINESS CYCLES.** American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. MR. EBERSOLE.
150. **ADVANCED FARM FINANCE.** Not open to those who have credit in Course 50. MR. DOWRIE.
155. **CORPORATION FINANCE.** The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. MR. STEHMAN.
167. **INDUSTRIAL RELATIONS.** Principles of labor administration for various types of organizations and workers. Job analysis, wages, stability of work, joint relations.
168. **PERSONNEL MANAGEMENT.** Problems and methods as to employment, promotion, training, health, safety, hours, working conditions, and employees' service.
176. **COMMERCIAL POLICIES.** Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. MR. BLAKEY.

177. FOREIGN TRADE. MR. BLAKEY.

180-181-182. SENIOR SEMINAR IN ECONOMICS. Advanced course work in marketing, production, consumption, prices, land economics, finance, statistics, accounting, transportation, etc., to suit the needs of advanced groups of students in these fields. MR. DOWRIE, MR. BLACK, MR. BLAKEY, MR. GARVER, MR. HEILMAN, MR. MUDGETT, MR. PRICE, MR. WORKING.

191-192. PUBLIC FINANCE. MR. BLAKEY.

193. STATE AND LOCAL TAXATION. MR. BLAKEY.

## EDUCATIONAL ADMINISTRATION AND SUPERVISION

### COLLEGE OF EDUCATION

Professor MERVIN G. NEALE.

#### COURSE

119. THE ELEMENTARY SCHOOL CURRICULUM. Principles underlying organization of subject-matter for courses in elementary school, including a critical examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum. MR. NEALE.

## EDUCATIONAL PSYCHOLOGY

### COLLEGE OF EDUCATION

Professor WILFORD S. MILLER; Assistant Professor MARVIN J. VAN WAGENEN.

#### COURSES

55. EDUCATIONAL PSYCHOLOGY. A survey of fundamental facts of human behavior involved in educational activities. Open to seniors, juniors, and qualified students in third quarter of sophomore year upon advice of Dean Haggerty. MR. MILLER.

106-107-108. ADVANCED EDUCATIONAL PSYCHOLOGY. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; typical learning experiments. Group and individual differences, their relations to educational practice. MR. VAN WAGENEN.

111. EDUCATIONAL DIAGNOSIS. Typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure, based on the results of the tests. MR. VAN WAGENEN.

## ENGLISH

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors ELMER E. STOLL, RICHARD BURTON;<sup>1</sup> Associate Professors JOSEPH W. BEACH, CECIL A. MOORE.

*General statement.*—The following courses are recommended for election by the students of the College of Agriculture, Forestry, and Home Economics.

## COURSES

- 1-2-3. GENERAL SURVEY OF ENGLISH LITERATURE. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods.
6. CHAUCER. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English.
8. SHAKESPEARE. Shakespeare's development as a poet and dramatist up to *King Lear*. MR. STOLL.
40. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. (Not offered in 1922-23.) MR. BURTON.
41. BROWNING AND TENNYSON. MR. BURTON.
- 44-45. AMERICAN LITERATURE. MR. MOORE.
51. SPENSER. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene*. (Not offered in 1922-23.) MR. STOLL.
53. SEVENTEENTH-CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry. MR. MOORE.
- 58-59. NINETEENTH-CENTURY PROSE. The more important prose writers of the nineteenth century; their styles, personalities, opinions, and relations to their period. MR. BEACH.
62. MILTON. Milton, with some consideration of his contemporaries. MR. STOLL.
64. BACON. Bacon as an essayist and as a promoter of learning. (Not offered in 1922-23.) MR. STOLL.
66. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. MR. BURTON.

<sup>1</sup> Absent on leave, fall and winter quarter.

70. MASTERPIECES OF ELIZABETHAN DRAMA. Elizabethan dramatic art aside from Shakespeare's. Special attention to the art of the chief writers—Marlowe, Jonson, Beaumont and Fletcher, Webster, and Massinger. MR. STOLL.

### ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, ARTHUR G. RUGGLES, FREDERIC L. WASHBURN; Assistant Professors ROYAL N. CHAPMAN, HARRY H. KNIGHT, OSCAR W. OESTLUND; Instructor SAMUEL A. GRAHAM.

*General statement.*—Courses in this department are closely correlated with those offered by the Department of Animal Biology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 117-118-119, 125-126-127, 130, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Animal Biology.

For introductory courses in general entomology see 37-38-39 and An. Biol. 16.

#### COURSES

3. ECONOMIC ENTOMOLOGY. The life histories, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. MR. RUGGLES.
4. ECONOMIC VERTEBRATE ZOOLOGY. Relations of birds and wild animals to agriculture. Lectures, laboratory, and field work. Identification and studies of Minnesota birds and wild animals affecting the horticulturist and agriculturist, methods of combating injurious and conserving useful forms. MR. WASHBURN.
6. INSECTS OF FOREST PRODUCTS. Treating life history, habits, and control of insects attacking dead or freshly felled wood, and forest products. MR. GRAHAM.
7. GENERAL FOREST ENTOMOLOGY. A field course treating of insects affecting trees under actual forest conditions. MR. GRAHAM.
8. VARIETIES AND HABITS OF FUR-BEARING ANIMALS. Deals with North American fur bearers with special reference to their adaptability to domestication and commercial fur-farming. MR. WASHBURN.
12. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. Lectures and laboratory work. MR. WASHBURN.
20. HOME ECONOMIC ENTOMOLOGY. Designed for home economics students. Insects as related to public health problems, insects of the household and those attacking foods will be discussed. The principles of control of insect pests of plants will be considered. MR. RILEY, MR. RUGGLES.



- 37-38-39. **GENERAL ENTOMOLOGY.** Leads up to discussion of the principles of taxonomy and their application to the classification of insects. Text-book, lectures, quizzes, and laboratory. MR. OESTLUND.
44. **INTRODUCTORY COURSE IN ANIMAL PARASITES AND PARASITISM.** Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites. Methods of control and prevention will be emphasized. MR. RILEY.
- 117-118-119. **GENERAL ECOLOGY OF INSECTS.** General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. MR. CHAPMAN.
- 125-126-127. **ADVANCED GENERAL ENTOMOLOGY.** Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. MR. OESTLUND.
130. **BIOLOGY AND TAXONOMY OF THE APHIDIDAE.** Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered in Course 197. MR. OESTLUND.
- 139-140. **HISTOLOGY AND DEVELOPMENT OF INSECTS.** Lectures and laboratory work on the histology, embryonic, and postembryonic development of insects. Individual work along these lines is available to properly qualified students in Course 197. MR. RILEY.
- 144-145-146. **ANIMAL PARASITES AND PARASITISM.** Lectures and laboratory work. Origin and biological significance of parasitism; structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animal. MR. RILEY.
150. **INSECTICIDES AND THEIR ACTION.** A study of the chemical composition, the physical properties, and the physiological action of standard, of little-known, and of new insecticides.
197. **INTRODUCTION TO RESEARCH.** Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. MR. KNIGHT, MR. OESTLUND, Systematic Entomology; MR. RUGGLES, General Economic Entomology; MR. CHAPMAN, Insect Ecology; MR. RILEY, Parasitology, Insect Morphology; MR. WASHBURN, Economic Vertebrate Zoology.

#### FARM ENGINEERING

Professor WILLIAM BOSS; Associate Professors HARRY B. ROE, EARL A. STEWART, MARK J. THOMPSON; Assistant Professors GUY R. B. ELLIOTT, ARTHUR J. SCHWANTES, JAMES B. TORRANCE, ARTHUR G. TYLER,

HALL B. WHITE; Instructors J. GRANT DENT, MAURICE G. JACOBSON, ALLEN D. JOHNSTON.

## COURSES

3. MECHANICAL DRAWING. Materials, instruments, and their uses. The conventions, lettering, scale-reading, kinds of drawings, practice in pictorial drawing and drawing building plans. MR. JACOBSON.
4. BLACKSMITHING. The management of forge and fire in bending, shaping, and welding iron. MR. JOHNSTON.
5. FRAMING AND BUILDING CONSTRUCTION. Instruction and practice in framing, construction, and painting of farm buildings. MR. WHITE.
7. FARM STRUCTURES. The planning, designing, and location of farm buildings including specifications and estimates of cost. MR. WHITE.
8. FARM ENGINEERING. A general course of farm engineering. Lectures on farm mechanics, drainage, water supply, heating, sanitation, buildings, roads, power machinery, and land-clearing. MR. BOSS.
11. APPLIED MATHEMATICS. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work; e.g., areas, volumes, percentages, proportions, variations, investments, cost problems, etc.
13. FARM MOTORS I. Theory, operation, care, and repair of gasoline engines. MR. TORRANCE.
14. FARM MOTORS II. Instruction and practice in the care, adjustment, and operation of the farm tractor. MR. TORRANCE.
17. ADVANCED BLACKSMITHING. Bending, shaping, welding, and tempering of steel. MR. JOHNSTON.
18. SURVEYING. Plain surveying as applied to agriculture and forestry. Land surveying, mensuration, leveling, elements of topography, and mapping. MR. ROE.
23. GENERAL PHYSICS. The elements of physics for those who have not had physics in high school. Mechanics, heat, light, and electricity with laboratory work. MR. STEWART, MR. TYLER.
24. AGRICULTURAL PHYSICS I. An applied course involving lecture and laboratory work in mechanics and heat. Special emphasis given to farm power, hydraulics, heating, ventilation, and meteorology. MR. STEWART.
25. AGRICULTURAL PHYSICS II. A practical lecture, recitation, and laboratory course on electricity and light, including electric generating plants, batteries, motors, lighting systems, and light and radiant energy as applied to farm problems. MR. STEWART.

28. LAND-CLEARING. Land-clearing methods, explosives, and machinery. Farm development in cut-over timber districts. MR. THOMPSON, MR. SCHWANTES.
31. PRINCIPLES OF DRAINAGE. Elementary principles and practice of drainage, simple leveling, and grade determination, field technique of tile drainage survey and construction and lecture on drainage in relation to plant growth, crop and land values, and farm development. MR. ROE, MR. ELLIOTT.
34. HOUSEHOLD MECHANICS AND HEAT. Lectures, recitations, and laboratory work on household appliances and methods of operation, such as water supply, plumbing, sewage disposal, washing, cooking, refrigeration, heating, and ventilation. (Open only to students in H. E.) MR. STEWART.
35. HOUSEHOLD ELECTRICITY AND LIGHT. A course with laboratory work on the fundamental principles of electricity and the use of electrical appliances in the home, with a special study of light, color, and lighting. (Open only to students in H. E.) MR. STEWART.
37. RURAL SANITATION. Wells, pumps, and water supply, with methods of securing sanitary water systems for farmsteads and rural institutions. Sanitary sewage disposal methods for homes, creameries, etc. MR. STEWART.
38. ADVANCED MECHANICAL DRAWING. Applied to landscape gardening problems. MR. JACOBSON.
40. MECHANICAL TRAINING. Instruction and laboratory practice in mechanical trades, embracing rope work; belt-lacing and pulleys; cement work; soldering; sharpening tools; pipe-fitting; cold metal work; electric wiring; babbitting; glazing; painting; wood-finishing; harness repair; etc. MR. DENT.
101. ADVANCED DRAINAGE. Special drainage problems including surface run-off, soil permeability, relation of soil type to drainage, studies in peat land drainage, shape and regulation of water table in relation to root growth, etc. MR. ROE.
136. EXPERIMENTAL PHYSICAL ANALYSES. A laboratory course in physical measurements for specialists in the agricultural sciences. The work includes the use of bridges, potentiometers, galvanometers, refractometers, spectrometers, polarimeters, thermocouples, etc.

## FORESTRY

Professors EDWARD G. CHEYNEY, JOHN H. ALLISON; Associate Professor JOHN P. WENTLING; Instructors LELAND L. DE FLON, THORWALD S. HANSEN, GILBERT H. WIGGIN,

## COURSES

1. GENERAL FORESTRY. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the United States forests. Lectures and collateral reading. MR. CHEYNEY.
2. ELEMENTARY DENDROLOGY. Trees and shrubs found in Itasca Park, with special reference to identification by means of gross characters. MR. WENTLING.
- 3-4. DENDROLOGY. The forest trees of the United States; their classification, characteristics, and range, with special attention to prominent and constant characteristics. Lectures, assigned reading, laboratory. MR. WENTLING, MR. DE FLON.
5. ELEMENTARY SYLVICULTURE. Largely field work designed to give the student a working knowledge of the forest. Includes silvicultural study of the species found in the north woods and the general principles underlying silvicultural reconnaissance. MR. WENTLING.
9. ELEMENTARY MENSURATION. Largely field work. Includes elementary work in timber-cruising, valuation surveys, stem analysis, and the study of the measurements of stand, volume, and yield. MR. ALLISON.
10. FOREST MENSURATION. The basic principles underlying the measurement of forest products. Measurement of standing and felled timber. Special attention is given to log rules, preparation and use of volume tables, growth of trees, and yield table. MR. HANSEN.
11. FOREST VALUATION. The business of forest management. A study of the different factors entering into the valuation of forest property. MR. ALLISON.
20. GRAZING. History of grazing in the West. Kinds of stock used. Forage plants. Regulations and methods of handling stock. Range management and protection. Lectures, recitations, and reading. MR. ALLISON.
23. FACTORY EXPERIENCE. Two or more months in a factory utilizing wood by-products such as pulp or paper mill, wood distillation or wood preservation plant.
26. TREE CROPS. The part trees play in the successful development of the farm. The relation of the forest to agriculture and animal husbandry. The farm and the timber supply. MR. CHEYNEY.
27. GROVES AND WINDBREAKS. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products. MR. WIGGIN.
28. LOGGING. The practice, cost, and development of the different logging methods in use in the different forest regions of the United States,

- and the modifications required by forest management. Report based on personal investigations required. MR. CHEYNEY.
29. SAWMILL AND WOOD-WORKING MACHINERY. Sawmills, wood-working machinery, and other processes in the primary manufacture of lumber products. MR. CHEYNEY.
  30. SEASONING OF WOOD. The theory and practice of air seasoning and kiln drying the different species of wood and the different forms of wood products; the results obtained and the defects to be avoided. MR. CHEYNEY.
  32. LUMBER DISTRIBUTION. The standing timber of the United States in its relation to the lumber market. The organization of the industry and the distributing agencies. MR. CHEYNEY.
  - 33-34. WOOD STRUCTURE AND IDENTIFICATION. Structure, classification, and identification of the most important commercial, domestic, and foreign woods. Lectures, papers, laboratory. Record's *Economic Woods* used as a text. MR. WENTLING.
  35. SEEDING AND PLANTING. The cultural principles, operations, methods, and equipment in nursery work and artificial regeneration. Includes seed-collecting, storing, sowing, raising seedlings, packing, transplanting, field-planting, packing for shipment, etc. MR. WIGGIN.
  36. POLICY AND ADMINISTRATION. Policy of the United States and the states toward the utilization of the public forest resources. Policy of other owners toward forest resources controlled by them. Administration of the national and state forests. MR. ALLISON.
  39. WOOD PRESERVATION. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used. MR. ALLISON.
  41. SYLVICS. The fundamentals forming the basis of silviculture with special attention to the sylvics of the important tree species. Lectures, readings, and required papers. MR. WENTLING.
  43. SYLVICULTURAL LABORATORY. Nursery practice and field-planting. Field investigations and planting plans. Seed-collecting, extracting, and storing. Daily nursery and field work. MR. WENTLING.
  44. WOOD PULP AND PAPER. The manufacture of wood pulp and wood pulp papers. MR. ALLISON.
  46. FOREST REGULATION LABORATORY. Field work. The collection of the data necessary to working up a forest working plan. Includes the making of the timber estimates, growth studies, and maps necessary to a forest working plan. MR. ALLISON.



- 47-48. **FOREST PRODUCTS.** An introductory survey of the whole field of products of the forest—wood in all its forms, and products other than wood, as pulp, paper, naval stores, wood distillates, tannins, etc. Lectures, reading, papers. MR. WENTLING, MR. ALLISON.
101. **ADVANCED DENDROLOGY.** A continuation of Course 3-4 with special studies in classification and distribution of the timber species of the world. MR. WENTLING.
106. **INVESTIGATIVE METHODS IN FORESTRY.** The fundamental principles upon which silviculture is based. Methods used at experiment stations in solving problems in forestation, protection, and management. MR. HANSEN.
107. **USES OF WOOD I.** The economic hard and soft woods, both foreign and domestic from standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood-using industries. Lectures, reading, reports. MR. WENTLING.
108. **USES OF WOOD II.** A continuation of Course 107 dealing with the industries and the woods they use. Kinds, grades, qualities, properties, requirements for each product. Use, re-use, distribution of product. Regions of production and relation to other industries. Lectures, reading, reports. MR. WENTLING.
109. **USES OF WOOD III.** The actual use of wood in the industries. At least six hours per week must be spent in actual study in a factory. Complete reports and collateral reading. MR. WENTLING.
110. **MECHANICAL AND PHYSICAL PROPERTIES OF WOOD.** Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timber. MR. WENTLING.
112. **ADVANCED FOREST MENSURATION.** Continuation of Course 10 with special emphasis on tree forms. The development of the formula used in study of volume and growth of trees. MR. HANSEN.
113. **ADVANCED FOREST BY-PRODUCTS** Methods of production of wood pulp and paper products, naval stores, tannins, oils, wood distillation products, etc. Lectures, reading, reports. MR. ALLISON.
119. **ADVANCED WOOD STRUCTURE I.** A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, and mounting of typical sections. Reference reading and reports. MR. WENTLING.
120. **ADVANCED WOOD STRUCTURE II.** Study of wood structure in relation to seasoning, mechanical failures, penetration of preservatives, variation in strength, etc. MR. WENTLING.

## GEOLOGY AND MINERALOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor WILLIAM H. EMMONS; Instructors IRA S. ALLISON, JOHN W. GRUNER, GEORGE M. SCHWARTZ, GEORGE A. THIEL, W. COURTNEY WERNER.

#### COURSES

- 1-2. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. EMMONS, MR. ALLISON, MR. THIEL.
- 7-8. LABORATORY WORK. Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. MR. ALLISON.
- 11-12. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. WERNER.
- 21-22. ESSENTIALS OF MINERALOGY. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals. Determinative work in laboratory, blowpipe analysis, sight identification. MR. GRUNER.
29. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions.
34. METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the weather bureau; the major climatic divisions of the earth and their climates.
37. ECONOMIC AND COMMERCIAL GEOGRAPHY. Geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized.
- 51-52. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures and field excursions. MR. SCHWARTZ.

## GERMAN

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professor JAMES DAVIES; Instructors HARRY S. CANNON, LYNWOOD DOWNS, RICHARD JENTE.

1. BEGINNING A. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse.
2. BEGINNING B. Continuation of Course I.
3. BEGINNING C. Selected texts from modern writers.
10. RAPID READING. Modern narrative prose.
11. ADVANCED RAPID READING. Continuation of Course 10. Representative works of the eighteenth and nineteenth centuries.
- 28-29. CHEMICAL GERMAN. Selections from more difficult works on chemistry.
- 31-32. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology.
- 50-51-52. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay-writing on assigned subjects. MR. JENTE.
62. NINETEENTH-CENTURY PROSE. Narrative readings from modern novelists. MR. CANNON.
63. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. MR. DAVIES, MR. DOWNS.
64. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. MR. DAVIES, MR. DOWNS.
77. GOETHE'S FAUST I. MR. SCHLENKER.

## HISTORY AND PHILOSOPHY OF EDUCATION

### COLLEGE OF EDUCATION

Professor FLETCHER H. SWIFT; Assistant Professor ROSS L. FINNEY;  
Instructor JEAN H. ALEXANDER.

### COURSES

1. A BRIEF COURSE IN THE HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high school teachers. Not open to those who have credit in Public Education in the United States, .5. MR. SWIFT, MISS ALEXANDER.
3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. MR. FINNEY.

5. PUBLIC EDUCATION IN THE UNITED STATES. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. MR. SWIFT.

101-102-103. FOUNDATIONS OF MODERN EDUCATION. Interpretative historical study of elements in modern education derived from Hebrews, Greeks, Romans, Middle Ages, etc. Emphasis upon secondary and higher education, origin and results of monopoly of cultural conception of education and cultural studies. MR. SWIFT.

### HOME ECONOMICS

Professor —————; Associate Professors ALICE BIESTER, HARRIET GOLDSTEIN, MARION WELLER; Assistant Professors ALICE M. CHILD, AMY P. MORSE, E. MAUDE PATCHIN, ETHEL L. PHELPS, LENORE RICHARDS, LUCY A. STUDLEY, NOLA TREAT; Lecturer MARTHA B. MOORHEAD; Instructors EDLA ANDERSON, CARLOTTA BROWN, HALLY J. FISHER, VETTA GOLDSTEIN, RUTH M. LINDQUIST, MABEL C. McDOWELL; Extension Specialists MARY L. BULL, LUCY CORDINER, ADELE KOCH, JULIA NEWTON, EUNICE RYAN, JUNIATA L. SHEPPARD.

*General statement.*—The following courses are planned primarily for students majoring in home economics, and are required in the courses of study in home economics, outlined on pages 46 to 51. They are open for election to students in other courses who offer the prerequisites as stated on pages 136 to 137.

### COURSES

3. TEXTILES. Textile fibers, their structure, properties, and chemical reactions; fabrics, their structure and processes of manufacture; art and economic consideration in selection and purchase of materials for clothing and household-furnishing. MISS WELLER, MISS PHELPS.
4. TEXTILES. A condensed course for students in Science, Literature, and the Arts and Education. MISS WELLER, MISS PHELPS.
- 5-6. TEXTILES. Same as Course 4. For teachers. Extended through two quarters. MISS WELLER.
1. GARMENT-MAKING. Instruction and laboratory practice in hand sewing, reading and adaptation of commercial patterns, use of the sewing machine, designing, cutting, and making simple garments from washable materials. MISS McDOWELL.
13. DRESSMAKING. Quality, suitability, and cost of materials adapted to technique in construction of wool dresses; adaptation of art principles in selection of designs; instruction and practice in methods of construction; construction of dress form. MISS PATCHIN, MISS McDOWELL.

17. **ADVANCED CLOTHING CONSTRUCTION.** Laboratory course involving application of principles of costume-modeling in the construction of one high-grade garment, suit, coat, or dress. One day a week devoted to a millinery problem. MISS PATCHIN, MISS CARLOTTA BROWN.
18. **COMMERCIAL CLOTHING MANUFACTURE.** Laboratory practice upon commercial basis. Shop organization, with problems involving clothing design and construction.
21. **FOODS AND COOKERY.** (a) Production, manufacture, chemical composition of typical foods; their classification into food principles; changes in digestion; function in nutrition. (b) Fundamental science principles from chemistry, physics, biology, bacteriology, and their application in typical cookery processes. MISS CHILD.
22. **FOOD ECONOMICS.** Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. MISS CHILD.
23. **NUTRITION I.** (1) The groups of compounds occurring in the cell and in food; (2) digestion, and (3) absorption. MISS BIESTER, MISS ANDERSON.
24. **CAMP COOKERY.** The simpler cookery processes; and such adaptations as are practicable in the several types of out-of-door camps. Not open to home economics students. For prospective foresters, engineers, and others. (Given in alternate years. Not offered in 1922-23.) MISS CHILD.
25. **FOOD AND ITS PREPARATION.** Chemical composition and physiological significance of foodstuffs. Principles of cookery underlying the preparation of foods: planning and preparation of normal and special diets. MISS CHILD.
34. **HOME MANAGEMENT: OPERATION AND MAINTENANCE, LECTURES.** Discussion of management responsibilities of home-maker with special emphasis on budgets and household accounts. MISS STUDLEY.
35. **HOME MANAGEMENT: OPERATION AND MAINTENANCE, LABORATORY PRACTICE.** Twelve weeks actual experience in a home management house with various household management problems including the care and training of a child of pre-school age. MISS STUDLEY, MISS LINDQUIST.
37. **HEALTH CARE OF THE FAMILY.** (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sickroom; observation and care of the patient; elementary symptomatology. MISS MOORHEAD, MISS FISHER.
38. **FIRST AID.** Bed-making, general care and observation of patient; emergencies and first aid treatment. MISS FISHER.



- 40, 42, and 43. See Home Economics Education, page 86.
44. **METHODS IN HOME ECONOMICS EXTENSION WORK.** Study of state and national plans for home economics extension work; methods of organization and practical presentation of subject-matter; preparation of illustrative material; field work. MISS NEWTON.
45. **HOME ECONOMICS SURVEY.** A discussion of the historical development of home economics with special emphasis upon current problems.
- 46, 47, 48, 49. See Home Economics Education, page 86.
51. **DRAWING AND DESIGN.** Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, proportion, emphasis, balance, and rhythm, in design. MISS V. GOLDSTEIN.
52. **ART HISTORY AND APPRECIATION.** The historical development of art, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles. MISS H. GOLDSTEIN, MISS V. GOLDSTEIN.
53. **ADVANCED DESIGN.** Problems in design for house furnishings and for costume, including dress-modeling. MISS H. GOLDSTEIN, MISS V. GOLDSTEIN.
54. **INTERIOR DESIGN.** Special problems in interior decoration to be worked out as far as possible in actual materials. Special emphasis on color and texture combinations. MISS MORSE.
55. **DECORATIVE NEEDLEWORK AND OTHER CRAFTS.** Applied design in needlework, lace, and appliqué, in problems relating to dress and house furnishings. MISS MORSE.
57. **WEAVING AND OTHER CRAFTS.** Applied design in two and four harness hand-loom weaving, batik and block printing in problems relating to dress and house-furnishing. MISS MORSE.
58. **COSTUME DESIGN.** A study of figure construction; line, color, and textures for beautiful arrangements and with reference to individual types. Laboratory work with fabrics and designs carried out in pencil and water colors. MISS H. GOLDSTEIN.
61. **LARGE QUANTITY COOKERY AND MARKETING.** Application of principles of cookery to large quantity preparation; planning of meals for dining-hall and cafeteria; calculation of cost and calories in standard servings; study of problems involved in purchase of institution supplies. MISS RICHARDS.
63. **INSTITUTION EXPERIENCE.** Experience in the minor problems of administration. MISS RICHARDS, MISS TREAT.

70. **FOOD PREPARATION IN RELATION TO SOCIAL WORK.** The principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. MISS LINDQUIST.
71. **ELEMENTARY DIETETICS FOR THE SOCIAL WORKER.** Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals.
72. **HOME MANAGEMENT PROBLEMS.** Involves the making of sound budgets. Studies are based upon racial groups and the size of the family together with the income. MISS LINDQUIST.
103. **DIETETICS.** The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health, and under such pathological conditions as are chiefly dependent upon dietetic treatment. MISS BIESTER.
105. **EXPERIMENTAL COOKERY.** An intensive study of problems in foods and food preparation with individual laboratory problems. MISS CHILD.
108. **NUTRITION II.** Metabolism including work on tissues, blood, milk, and urine. MISS ANDERSON.
109. **ADVANCED NUTRITION.** Selected quantitative methods applicable to investigations relating to digestion and metabolism. MISS BIESTER, MISS ANDERSON.
110. **SPECIAL PROBLEMS IN DIETETICS.** An intensive study of problems relating to diet involving assigned readings, discussions, and field work. MISS BIESTER.
111. **SPECIAL FOOD PROBLEMS.** A continuation of experimental cookery involving more advanced problems. MISS CHILD.
122. **ADVANCED TEXTILES.** An experimental study of textile problems such as shrinkage and other laundering applications; textile legislation; and special economic problems. MISS WELLER, MISS PHELPS.
123. **CLOTHING ECONOMICS.** General consideration of the economic problems in clothing production; women's responsibility for conditions in textiles and clothing industries; study of the budget for clothing and household textiles; hygiene and standardization of dress. MISS WELLER.
126. **TEXTILE ANALYSIS AND RELATED PROBLEMS.** Problems and application of quantitative methods in textile analysis with special reference to establishing standards for fabrics. MISS WELLER, MISS PHELPS.
131. **HOME MANAGEMENT: HOUSE-PLANNING AND EQUIPMENT.** House-planning, house-furnishing and equipment, and construction and furnishing budgets. Types of domestic architecture; site; floor plans;

building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. MISS MORSE.

151. INSTITUTION MANAGEMENT PROBLEMS. Lectures and discussions of the problems involved in institution management; organization; service; institution-planning, decoration, and equipment; budgets, and the study of different types of institutions. MISS TREAT.

## HOME ECONOMICS EDUCATION

### COLLEGE OF EDUCATION

Professor —————; Associate Professor HARRIET GOLDSTEIN; Assistant Professors ALMA L. BINZEL, CLARA M. BROWN, MAUDE J. MILLER; Instructors ELIZABETH BACON, AMANDA EBERSOLE, AURA KEEVER.

*General statement.*—The University teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. No formal application is necessary for transfer from the College of Agriculture, Forestry, and Home Economics to the College of Education if such transfer is made at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

### COURSES

40. CHILD-TRAINING. Application of modern science especially child psychology in training and educating children. Emphasis placed on the conservation of the child as an obligation of the home and the nation through training for parenthood. MISS BINZEL.
42. SPECIAL METHODS OF TEACHING HOME ECONOMICS. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach. MISS CLARA BROWN, MISS MILLER.
43. ORGANIZATION AND METHODS FOR RELATED ART-TEACHING. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes. MISS H. GOLDSTEIN.
46. OBSERVATION AND TEACHING: RELATED ART. A course similar to 47, but dealing with the teaching of related art. MISS CLARA BROWN, MISS BACON.
47. OBSERVATION AND TEACHING: FOODS AND HOME MANAGEMENT. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, result, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management. MISS MILLER.

48. OBSERVATION AND TEACHING: TEXTILES AND CLOTHING. A course similar to 47, but dealing with the teaching of textiles and clothing. MISS CLARA BROWN, MISS BACON, MISS EBERSOLE.
49. OBSERVATION AND TEACHING: GENERAL HOME ECONOMICS. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course. Those who have completed 46, 48, or 49 may register and receive 2 credits. MISS CLARA BROWN, MISS MILLER.
141. PROBLEMS IN HOME ECONOMICS EDUCATION. Problems of administration and supervision of home economics, study of curricula for the day, part-time and evening schools, consideration of home project, the hot lunch, and other related work.

### HORTICULTURE

Professor WILLIAM H. ALDERMAN; Associate Professors WILFRID G. BRIERLEY, LEROY CADY; Assistant Professor WILLIAM T. TAPLEY; Instructors JOHN H. BEAUMONT, JOHN W. BUSHNELL, FRED A. KRANTZ; Extension Specialist ROGER S. MACKINTOSH.

### COURSES

6. FRUIT-GROWING. The fundamental principles of fruit-growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning, and thinning. Lectures, recitations, references, and laboratory work. MR. ALDERMAN.
21. SMALL-FRUIT CULTURE. Cultural practices for each of the small fruits. Brief consideration is given to their botanical relationships and the history of their commercial development. Lectures, problems, and survey of literature. MR. BRIERLEY.
32. VEGETABLE-GROWING. Fundamentals of vegetable-growing applied to commercial and home gardens, scope of vegetable-gardening and place in agriculture. Capital required, locations, soil, equipment, marketing, storage, systems of production. Cultural methods for the various crops. MR. TAPLEY, MR. BUSHNELL.
33. VEGETABLE-FORCING. Commercial growing of vegetables in the greenhouse; types, construction, and management of forcing structures, soils, fertilization, soil sterilization, relation of industry to out-door vegetable-farming, crop production, and marketing. MR. TAPLEY.
50. FLORICULTURE. Designed to give the student a working knowledge of the culture and uses of common house plants, annuals, perennials, and greenhouse plants. Lectures, reference reading, and laboratory. MR. CADY.

56. PROPAGATION AND NURSERY PRACTICE. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference reading, and field trips. MR. CADY.
72. PLANT MATERIALS. Trees, shrubs, herbaceous plants, their native habitats and soils. A working knowledge of plant materials and their use in landscape design. Lectures, assigned readings, and problems. MR. CADY.
73. HISTORY OF LANDSCAPE DESIGN. Literature and development of landscape design and of the influences that have affected the different periods of the history. Lecture and assigned readings. MR. CADY.
74. PRINCIPLES OF LANDSCAPE DESIGN. Simple composition as applied to landscape-designing. Methods of presentation, drafting, and a study of the principles involved in landscape-planning especially of small properties. Lectures and laboratory.
75. LANDSCAPE DESIGN I. Landscape design as applied to country estates, city parks, play grounds and public institutions. Lectures, field trips, assigned readings, and reports.
76. LANDSCAPE DESIGN II. A continuation of 75. Landscape design as applied to larger landscape problems. Lectures, field trips, assigned readings, and reports.
91. ADVANCED GENERAL HORTICULTURE. For students in agricultural education. Emphasis given to advanced problems in orchard and garden management, judging and exhibiting, management of school gardens, ornamental planting of home and school grounds. MR. ALDERMAN, MR. CADY, MR. TAPLEY.
93. JUDGING HORTICULTURAL CROPS. The principles and practice of judging and exhibiting fruits, vegetables, and flowers. MR. ALDERMAN. MR. BRIERLEY, MR. CADY, MR. TAPLEY.
107. ORCHARD MANAGEMENT. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. MR. BRIERLEY.
109. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding, heredity, variation, biometry, and evolution are emphasized. Same as Agronomy 131. MR. BEAUMONT, MR. HAYES.
110. HORTICULTURAL CROP-BREEDING. Applied genetics are emphasized. The method of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. MR. BEAUMONT.



111. SYSTEMATIC POMOLOGY. Fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature. MR. ALDERMAN, MR. BRIERLEY.
131. ADVANCED VEGETABLE PRODUCTION. The business of vegetable-gardening, special problems, variety improvement, production of seed, investigation and research, reviews and reports on recent literature. MR. TAPLEY.
132. SYSTEMATIC OLERICULTURE. The origin, botany, varieties, and types of the different vegetables, their characteristics and adaptation to different cultural and market conditions, identification and classification studies, judging and exhibiting. MR. TAPLEY.
133. COMMERCIAL TRUCK-GROWING. Truck-growing centers of the United States, cultural methods, special machinery and equipment, market methods, shipping points. Adaptation of the truck crops to Minnesota, commercial production for canneries, handling and shipping. MR. TAPLEY.
135. POTATO PRODUCTION. Origin, botany, regional distribution, economic importance, group classification, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, cultural methods, seed selection and certification, marketing and utilization. MR. KRANTZ.
151. ADVANCED FLORICULTURE. Lectures, assigned readings, laboratory, and special problems dealing with the culture, botany, and history of florists' plants and methods of greenhouse management. MR. CADY.
- 191-192. SPECIAL PROBLEMS. Problems based upon the work given in the preceding courses. MR. ALDERMAN.
- 193-194-195. HORTICULTURAL SEMINAR. Reports and discussions of problems and investigational work. Horticultural staff.

### MILITARY SCIENCE AND TACTICS

Professor GIRARD STURTEVANT, Colonel, Infantry; Assistant Professors JAMES E. WARE, Lieutenant Colonel, Retired; HENRY H. RUTHERFORD, Lieutenant Colonel, Medical Corps; LAURENCE T. WALKER, Major, Coast Artillery Corps; LEE R. WATROUS, JR., Major, Coast Artillery Corps; FREDERICK R. WUNDERLICH, Major, Dental Corps; EDWARD G. SHERBURNE, Major, Infantry; JAMES E. WATSON, Captain, Signal Corps; NEWTON W. SPEECE, Captain, Infantry; ANDREW C. TYCHSEN, Captain, Infantry; RUSSELL C. THROCKMORTON, Captain, Infantry; LEO J. FARRELL, Captain, Infantry; HAL M. ROSE, Captain, Cavalry; Instructors JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired; CARL JENSEN, Regimental Supply Sergeant, Retired; JOHN MCWILLIAMS, 1st Sergeant, Retired; HENRY DAHL, 1st Sergeant,

Retired; HARRY E. STRIDER, Technical Sergeant, Signal Corps; ALFRED BRANDT, Technical Sergeant, Infantry; AUBREY DUNKUM, Staff Sergeant, Coast Artillery Corps; CLARENCE E. LANGE, Sergeant, Field Artillery; JOE WEIR, Sergeant, Infantry; EDMUND T. McCANN, Sergeant, Infantry; HENRY W. BROWN, Sergeant, Coast Artillery Corps; EARL J. BLONSHINE, Private, 1st Class, Coast Artillery Corps.

#### COURSES

- 1-2-3. FIRST-YEAR BASIC COURSE R.O.T.C. Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies, first aid.
- 4-5-6. SECOND-YEAR BASIC COURSE R.O.T.C. Practical and theoretical instruction in schools of the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies. Infantry, coast artillery, and signal corps.
- 51-52-53. FIRST-YEAR ADVANCED COURSE R.O.T.C.
- 54-55-56. SECOND-YEAR ADVANCED COURSE R.O.T.C.

#### MUSIC

##### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARLYLE M. SCOTT; Assistant Professor DONALD N. FERGUSON; Instructors GEORGE FAIRCLOUGH, GERTRUDE HULL, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

*General statement.*—Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music. Nine credits may be obtained. The following courses are recommended:

#### COURSES

- 1-2-3. HARMONY. Chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. MR. SCOTT.
- 10-11-12. ORGAN. MR. FAIRCLOUGH.
- 16-17-18. PIANOFORTE. Open to juniors who have mastered technical difficulties of the degree of Czerney's *School of Velocity* and the easier Haydn and Mozart sonatas. MR. SCOTT, MR. FERGUSON, MISS REEVES.
- 22-23-24. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty etudes, and easier Handel and Mozart sonatas. MR. SCHEURER.
- 28-29-30. VOICE. MISS HULL.
- 40-41-42. ORCHESTRA. MR. PEPINSKY.
- 43-44-45. CHOIR. MR. SCOTT.
- 46-47-48. APPRECIATION OF MUSIC. A non-technical course.

## PHYSICAL EDUCATION

## FOR MEN

Professors FRED W. LUEHRING, Director; T. NELSON METCALF; Associate Professor LOUIS J. COOKE, Assistant Director; Assistant Professor WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, CARL B. ROEMER; Assistants FRANK GILMAN, HARRY GOLDIE, FRED W. WHITTEMORE.

*General statement.*—The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

## COURSES

1. PERSONAL HYGIENE. Two hours per week; first six weeks of each quarter. Examination at close of course. DR. COOKE, DR. BROWN, MR. FOSTER.
- 2-3-4. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. MR. FOSTER, MR. GLIDDEN, MR. ROEMER.
- 5-6-7. ADVANCED LEADERS. Three hours a week. MR. FOSTER.
- 8-9-10. CORRECTIVE GYMNASTICS. Three to six hours a week instead of regular gymnasium or military drill in case of physical disability. DR. BROWN.
- 11-12. WRESTLING. Three times per week. Students admitted by special assignment. MR. GILMAN.
- 13-14-15. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. MR. GLIDDEN.

16-17-18. **ADVANCED SWIMMING.** Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. MR. GLIDDEN.

19-20. **BOXING.** By special arrangement a few students may be accommodated in this class which meets twice a week. MR. GOLDIE.

21-22-23. **INTRAMURAL ATHLETICS.** Competitive games in the various athletic leagues in football, basket-ball, hockey, track, field events, base-ball, tennis, swimming, bowling, etc. MR. WHITTEMORE.

### PHYSICAL EDUCATION FOR WOMEN

Professor J. ANNA NORRIS; Assistant Professors MAY S. KISSOCK, ALICE H. TOLG; Instructors GERTRUDE M. BAKER, HENRIETTA BROWNING.

*General statement.*—This department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first year in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Women's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 4), of all sophomores who can not pass the swimming examination (see Courses 22-23), and of all students permitted, for reasons connected with their physical condition, to carry less than the minimum number of credit hours. Physical examinations or consultations required annually of all students.

Elective classes arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education.

Six credits is the maximum number that can be gained by taking courses in exercise (Course 34-35-36, 40-41-42, 43-44-45).

#### *Shower Bath Fees.*

Elementary Physical Training, per quarter.....	\$2.50
All other exercise courses including swimming, per quarter.....	2.00
Maximum fee for two or more courses, per quarter.....	3.50

### COURSES

1-2-3. **ELEMENTARY PHYSICAL TRAINING.** Lighter forms of gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations. MISS KISSOCK, DR. TOLG, MISS BROWNING.

4. PRELIMINARY HYGIENE. One lecture a week. The most essential aspects of the care of the personal health. DR. NORRIS.
- 7-8-9. SOPHOMORE PHYSICAL TRAINING. Floor work, apparatus, and indoor and outdoor games.
- 10-11-12. SOPHOMORE ORTHOPEDIC GYMNASTICS. For those not able to take regular class work.
- 13-14-15. SOPHOMORE INTERPRETIVE DANCING. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. MISS BAKER.
- 16-17-18. SOPHOMORE ORGANIZED GAMES AND FOLK DANCES. Suitable in strength for C-D girls. Conducted outdoors when weather permits.
- 19-20-21. SOPHOMORE MAJOR SPORTS. Hockey in fall, basket-ball in winter, baseball in spring. Suitable in strength for A-B girls. MISS KISSOCK.
- 22-23. SOPHOMORE ELEMENTARY SWIMMING. For beginners.
- 28-29. SOPHOMORE ADVANCED SWIMMING.
32. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. MISS BROWNING.
33. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity, puberty, sex education. DR. NORRIS.
35. INTERMEDIATE PHYSICAL TRAINING. Gymnastics and apparatus work. Written abstracts of prescribed reading.<sup>1</sup>
37. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. No registration necessary.
- 43-44-45. FOLK DANCING AND ORGANIZED GAMES. Graded games, folk dances, and track for school and playground, two hours. A consideration of nature and function of play and practical conduct of playgrounds, one hour.<sup>1</sup> MISS KISSOCK.
- 46-47-48. HOCKEY, BASKET-BALL, AND BASEBALL. Hockey in autumn, basket-ball in winter, baseball in spring. MISS KISSOCK.
- 66-67-68. INTERPRETIVE DANCING. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. MISS BAKER.

<sup>1</sup> If taken for no credit no reading will be requested.



## PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Assistant Professor LOUALLEN F. MILLER; Instructor JOSEPH VALASEK.

### COURSES

1. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general course 1, 21, 31, 41. Course 2 should be taken in conjunction with this course. MR. ERIKSON.
2. ELEMENTS OF MECHANICS LABORATORY. Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 1. MR. ERIKSON.
9. ACOUSTICS. Fundamental principles of sound. Designed primarily for the students in the Department of Music. Open also to other students. MR. ERIKSON.
21. HEAT. The principles underlying heat phenomena. Course 22 should be taken in conjunction with this course. MR. MILLER.
22. HEAT LABORATORY. The laboratory part supplementing Course 21. MR. MILLER.
31. OPTICS. The principles underlying light phenomena. Course 32 should be taken in conjunction with this course. MR. VALASEK.
32. OPTICS LABORATORY. The laboratory part supplementing Course 31. MR. VALASEK.
41. MAGNETISM AND ELECTRICITY. The principles underlying magnetic and electric phenomena. Course 42 should be taken in conjunction with this course. MR. ZELENY.
42. MAGNETISM AND ELECTRICITY. The laboratory part supplementing Course 41. MR. ZELENY.

## PHYSIOLOGY

MEDICAL SCHOOL

Professors ELIAS P. LYON, JESSE F. MCCLENDON, FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Assistant Professor CHARLES C. GAULT.

### COURSES

4. HUMAN PHYSIOLOGY. Lectures and laboratory work. DR. LYON, DR. BEARD, or DR. GAULT, and assistants.

- 57-58.<sup>1</sup> HUMAN PHYSIOLOGY. An intermediate course. DR. LYON, DR. SCOTT, DR. GAULT, and assistants.
59. PHYSIOLOGIC CHEMISTRY. Intermediate course. DR. PETTIBONE and assistants.
- 100-101. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. DR. MCCLENDON, DR. PETTIBONE, DR. KINGSBURY, and assistants.
103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. DR. LYON, DR. SCOTT, DR. GAULT, and assistants.
104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES. Respiration, metabolism, nutrition, and excretion. DR. LYON, DR. SCOTT, DR. BEARD, and assistants.

### PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Assistant Professor ALVIN H. LARSON; Instructors HENRY D. BARKER, LOUISE DOSDALL, JULIAN G. LEACH, JAMES L. SEAL; Extension Specialist RAYMOND C. ROSE.

#### COURSES

1. PLANT PATHOLOGY. Plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10. MR. STAKMAN, MR. LEACH, MR. SEAL.
- 7-8. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. MR. LARSON.
9. WEEDS AND SEED-TESTING. Detailed study of seed-testing methods and seed legislation. Weed and crop seeds and weed plants studied with special reference to identification. MR. LARSON.
10. FOREST PATHOLOGY. Diseases of forest and shade trees, and the rotting of timber. Symptoms, etiology, and control. Lectures, laboratory, and reference work. Not open to those who have completed 1. MR. STAKMAN, MR. LEACH, MR. SEAL.
12. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed-testing methods. MR. LARSON.
14. PLANT DISEASE CONTROL. A detailed study of methods of controlling diseases of plants of parasitic origin. Spray materials and spray machinery. Practical applications. MR. BARKER.

<sup>1</sup> Courses 57-58 and 59 constitute a sequence recommended for students who wish a knowledge of human physiology, but who do not desire the detailed consideration given in Courses 100-101, 103, and 104. A student can not receive credit for both of these sequences.

### ADVANCED COURSES

- 105-106-107. MYCOLOGY. Morphology, taxonomy, and biology of fungi. Lectures, laboratory, greenhouse, and field work. MISS DOSDALL.
108. METHODS. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems. MR. LEACH.
110. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy; parasitism, biological, specialization, resistance, and immunity. MR. STAKMAN, MR. BARKER.
111. DISEASES OF FIELD CROPS. Detailed study of diseases of cereal and forage crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work. MR. STAKMAN, MR. BARKER.
- 112.<sup>1</sup> DISEASES OF FRUIT CROPS. Special study of diseases of fruit crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work. (Given in alternate years. Offered in 1922-23.) MR. LEACH.
- 113.<sup>1</sup> DISEASES OF VEGETABLE CROPS. A detailed study of diseases of potatoes and other vegetable crops. Lecture, reference, laboratory and greenhouse work. MR. LEACH.
114. ADVANCED FOREST PATHOLOGY. A detailed study of wood rots, including a study of the deterioration of wood products caused by fungi. Lectures, laboratory, and greenhouse work. MR. STAKMAN, MR. LEACH.

### POLITICAL SCIENCE

#### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors CEPHAS D. ALLIN, ROBERT E. CUSHMAN, JEREMIAH S. YOUNG.

#### COURSES

1. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system.
7. STATE GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. MR. CUSHMAN.

51-52-53. BUSINESS LAW. Principles covering ordinary business transactions, contracts—formation, operation, interpretation, breach, and

<sup>1</sup> Courses 112 and 113 will ordinarily alternate with each other. One but not both will be given in 1922-23.

discharge. Agency and service. Negotiable instrument. Business associations—partnership and private corporations. Properties—personal and real. MR. YOUNG.

## POULTRY HUSBANDRY

### ANIMAL INDUSTRY GROUP

Professor ARTHUR C. SMITH; Extension Specialists, NORTON E. CHAPMAN, CORA E. COOKE.

#### COURSES

1. POULTRY. The poultry industry; best methods of care and management of fowls, turkeys, ducks, and geese and the most important breeds of same. MR. SMITH.
2. POULTRY-JUDGING. The history, standard requirements, and common defects of the leading commercial standard breeds and varieties and determination and standard values by the score card and comparison methods. MR. SMITH.
4. INCUBATING AND BROODING. Instruction and practice in incubation and brooding, selection of breeding stock and eggs for hatching, and feeding young chicks. Of practical value to teachers of agriculture and poultry raisers. MR. SMITH.
5. ADVANCED POULTRY-JUDGING. Practice in close selection for standard values of all different color patterns and principal types; mating to produce high standard quality. MR. SMITH.

## PSYCHOLOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, KARL S. LASHLEY, DONALD G. PATERSON, HERBERT WOODROW; Lecturer HARRY M. JOHNSON.

#### COURSES

- 1-2. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week. MR. ELLIOTT, MR. FOSTER.
- 1-6. GENERAL PSYCHOLOGY FOR BUSINESS STUDENTS. Offered only to business and pre-business students. MR. ELLIOTT, MR. FOSTER, MR. PATERSON.
3. PSYCHOLOGY APPLIED TO DAILY LIFE. Measurement of mental traits, development of intelligence, organization of personality, with applications to selected problems in medicine, law, education, sociology, and daily life. MR. ELLIOTT, MR. FOSTER, MR. PATERSON.

- 4-5. INTRODUCTORY LABORATORY PSYCHOLOGY. Simple experiments providing the beginner illustrative material and training in the methods of laboratory psychology. Required for all advanced courses in general psychology. Four laboratory hours per week. MR. FOSTER and others.
7. INTRODUCTORY LABORATORY PSYCHOLOGY. Identical with 4-5. Eight laboratory hours per week. MR. FOSTER and others.
9. ANIMAL BEHAVIOR. An account of the evolution of instinct, habit, and intelligence in animals. The application of animal studies to problems of human psychology. Lectures, demonstrations, and reading on assigned topics. MR. LASHLEY.
- 101-102-103. EXPERIMENTAL PSYCHOLOGY. The theory and technique of leading methods of experimental investigation in human psychology. Individual minor research problems in the third quarter. One lecture, four laboratory hours per week. MR. WOODROW, MR. JOHNSON.
- 108-109. ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of the normal, adult mind, based upon the study of experimental results. Lectures, recitations, and reports. MR. JOHNSON.
- 114-115. HUMAN BEHAVIOR. An analysis of the development and organization of human behavior. Consciousness or mind, as properties of the living body, are discussed in their dependence upon response. MR. ELLIOTT.
124. PSYCHOLOGY OF LEARNING. Critique of current theories concerning the nature of the learning process. Problems and methods bearing upon the physiology of learning. Not open to students who take neuro-psychology. MR. LASHLEY.
- 125-126. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES. Experimental and statistical study of the influence of sex, race, immediate ancestry, and environment, in the causation of individual differences in mental traits. Each student participates in investigation of problems and in analysis of results. MR. PATERSON.

## RURAL PUBLICATIONS AND JOURNALISM

Professor WILLIAM P. KIRKWOOD; Extension Specialist EDWIN C. TORREY.

*General statement.*—The aim of this division is to give practical training in agricultural journalism and in agricultural publicity and bulletin-writing.

## COURSES

- 10-11-12. AGRICULTURAL JOURNALISM. Gathering and writing agricultural news and writing articles for the agricultural press and other class papers; farm paper-editing. Lectures and practical work. MR. KIRKWOOD.



19. AGRICULTURAL PUBLICITY. Mediums and methods through which information may be brought to attention of communities and people of the open country. MR. KIRKWOOD.

### RHETORIC

Assistant Professors ROBERT C. LANSING, HARRY J. BURTIS; Instructors MINNIE M. CLAUSEN, RUTH MOHL, EVELYN A. TRIPP.

*General statement.*—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete three additional credit hours in rhetoric.

### COURSES

1. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS TRIPP.
2. RHETORIC II. Sentence structure, diction, exposition, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS TRIPP.
3. RHETORIC III. Description, narration, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS TRIPP.
4. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MISS TRIPP.
11. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. MR. LANSING, MR. BURTIS.
22. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. MR. BURTIS.
24. ADVANCED PUBLIC SPEAKING. Problems of speech and leadership of county agents, teachers, and college graduates in general. MR. BURTIS.
31. SURVEY OF ENGLISH LITERATURE I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries. MR. LANSING.
32. SURVEY OF ENGLISH LITERATURE II. Survey of English literature of the nineteenth century. MR. LANSING.

## ROMANCE LANGUAGES

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors EVERETT W. OLMS TED, IRVILLE C. LE COMPTE, COLBERT SEARLES;  
Associate Professors RUTH S. PHELPS; Assistant Professors FRANCIS  
B. BARTON,<sup>1</sup> JULES T. FRELIN, JOSEPH E. GILLET, GUSTAVE VAN ROOS-  
BROECK; Professorial Lecturer ANTONIO HERAS; Instructor NELSON F.  
COBURN.

#### COURSES

##### *French*

1-2. BEGINNING FRENCH.

3-4. INTERMEDIATE FRENCH.

20. ORAL AND WRITTEN FRENCH.

21-22-23. SURVEY OF FRENCH LITERATURE. An outline of the history of  
French literature from 1600 to present day. MR. SEARLES, MR.  
LE COMPTE, MR. VAN ROOSBROECK.

50-51-52. ELEMENTARY FRENCH CONVERSATION. MISS PHELPS, MR. FRELIN.

53-54-55. ELEMENTARY FRENCH COMPOSITION. MISS PHELPS, MR. FRELIN.

##### *Spanish*

1-2. BEGINNING SPANISH.

3-4. INTERMEDIATE SPANISH.

20. ORAL AND WRITTEN SPANISH.

50-51-52. SPANISH CONVERSATION. MR. COBURN.

53-54-55. SPANISH COMPOSITION. MR. COBURN.

65-66-67. SURVEY OF SPANISH LITERATURE. An outline of the history of  
Spanish literature from 1500 to the present day. MR. GILLET.

## SOCIOLOGY AND SOCIAL WORK

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor LUTHER L. BERNARD; Associate Professor MANUEL C. ELMER;  
Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST;  
Lecturers OTTO W. DAVIS, WILLIAM W. HODSON; Instructors LOUIS  
A. BOETTIGER, HUGH S. CARTER, CHARLES R. HOFFER, LEE O. LANTIS,  
GEORGE S. H. ROSSOUW.

#### COURSES

I. INTRODUCTION TO SOCIOLOGY. Origin and development of human societies;  
various agencies which have determined the type of social life; social  
organization, institutions, and progress; bearing of sociology upon other

<sup>1</sup> Absent on leave, 1922-23.

social sciences and arts. MR. BERNARD, MR. ELMER, MR. FINNEY, MR. LUNDQUIST, MR. BOETTIGER, MR. CARTER, MR. HOFFER, MR. LANTIS, MR. ROSSOUW.

3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. (Same as Hist. and Philos. of Educ. 3.) MR. FINNEY.
6. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. MR. ELMER, MR. FINNEY, MR. BOETTIGER, MR. ROSSOUW.
14. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. MR. BERNARD, MR. LANTIS, MR. HOFFER, MR. LUNDQUIST.
51. THE OCCURRENCE OF THE SOCIALLY INADEQUATE. The significance of the socially inadequate in contemporary and industrial societies and the description of the methods used in their care.
52. ELEMENTARY CASE WORK. The methods of case work as applied to the treatment of the socially inadequate.
53. ELEMENTS OF CRIMINOLOGY. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender, juvenile courts; preventive methods. MR. ELMER.
55. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town- and city-planning; garden cities. Lectures, readings, field work, and essay. MR. DAVIS.
60. CHILD WELFARE. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. MR. HODSON.
101. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. MR. BERNARD.
102. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. MR. BERNARD.

110. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. MR. BERNARD.
114. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. MR. LUNDQUIST.
119. THE FAMILY. The evolution of the family; its various forms and their relations to other social institutions; the service of the family in social evolutions; contemporary problems of the family (standards of living, birth rate, feminism, etc.) MR. ELMER.
120. SOCIAL PROGRESS. The basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. MR. BERNARD.
122. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. MR. ELMER.
123. SOCIAL STATISTICS. A study and analysis of social statistics and their bearing upon group life. The course is especially designed to give social workers and public health officials the training necessary to carry on their work successfully. MR. ELMER.
128. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. Methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. MR. DAVIS.
134. LEGAL PROTECTION OF THE CHILD. Relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. MR. HODSON.
140. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the more recent development of sociology. The theories are related to their social backgrounds. MR. BERNARD.
141. CONTEMPORARY SOCIAL THEORY. An intensive study of developments in the social theory of the late nineteenth and twentieth centuries. MR. BERNARD.

## SOILS

Professor FREDERICK J. ALWAY; Assistant Professor CLAYTON O. ROST;  
Instructor PAUL R. McMILLER; Extension Specialist GEORGE H. NESOM.

## COURSES

4. SOILS. Origin, formation, composition, and classification of soils; physical properties, moisture relations; principles of tillage. Lectures, laboratory and field work. MR. ROST.

5. SOIL FERTILITY. Principles of soil fertility; soil organisms; use of lime, commercial fertilizers, stable manure, and green manures in relation to crop production. Lectures and laboratory work. MR. ALWAY, MR. ROST.
101. CHEMICAL ANALYSIS OF SOILS. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients. MR. ROST.
102. SPECIAL PROBLEMS IN SOILS. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangement must be made in advance. MR. ALWAY.
104. SOIL-SURVEYING. Field practice in surveying soils and the preparation of soil maps. MR. McMILLER.
105. MINNESOTA SOILS. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures and laboratory. MR. ALWAY.
107. FERTILIZERS AND MANURES. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work. MR. ROST.
108. PHYSICAL PROPERTIES OF SOILS. The determination of physical constants of soils, including mechanical composition, moisture equivalent, and hygroscopic coefficient. MR. McMILLER.

## VETERINARY MEDICINE

## ANIMAL INDUSTRY GROUP

Professors CLIFFORD P. FITCH, WILLARD L. BOYD, MYRON H. REYNOLDS;  
Assistant Professors HOWARD C. H. KERNKAMP, WILLIAM A. BILLINGS;  
Instructor EARL A. HEWITT.

## COURSES

2. ANATOMY OF DOMESTIC ANIMALS. Anatomy of the common farm animals with special reference to bones, muscles, and viscera. Lectures and demonstrations. MR. KERNKAMP.
- 3-4. COMPARATIVE PHYSIOLOGY. A recitation and lecture course in physiology with special reference to the physiology of domesticated animals. Special emphasis is given to digestion and metabolism. MR. HEWITT.
6. PHYSIOLOGY AND HYGIENE OF BREEDING. Anatomy and physiology of reproduction. Embryology, obstetrics, sterility, hygiene, and common diseases of breeding animals. MR. BOYD.



8. **VETERINARY STUDIES.** Study of causes, prevention, treatment of common diseases; simple surgical operations; lameness and unsoundness; common medicines. Planned especially for students taking only one quarter veterinary work. Not open to those who have completed 12-13. MR. REYNOLDS.
12. **INFECTIOUS DISEASES.** Etiology, morbid anatomy, symptomatology, diagnosis, prevention, and the basis of treatment of the common infectious diseases of animals. Special instruction will be given in preparation and use of vaccines, bacterins, serums, and antitoxins. Those who have completed Course 8 can obtain only half credit for this course. MR. FITCH, MR. BILLINGS.
13. **NON-INFECTIOUS DISEASES.** General principles of diagnosis, causes, morbid anatomy, symptomatology, prevention, and the basis of treatment of the non-infectious diseases of animals. Those who have completed Course 8 can obtain only half credit for this course. MR. BOYD.
- 101-102. **ADVANCED ANATOMY OF DOMESTIC ANIMALS.** Advanced study, of the structures involved in the type, conformation, and nutrition of the common farm animals. Dissection of farm animals, including a study of the osseous, muscular, and other principal anatomical structures. Limited to nine students. MR. KERNKAMP.
- 103-104. **ADVANCED COMPARATIVE PHYSIOLOGY.** An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition. MR. HEWITT.

# COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

## TABULAR STATEMENT AND PROGRAM OF COURSES

1922-1923

## TABULAR STATEMENT AND PROGRAM OF COURSES

### CLASS HOUR SCHEDULE

	University Farm	Minneapolis Campus
I Hr	8:15- 9:05	8:30- 9:20
II Hr	9:15-10:05	9:30-10:20
III Hr	10:15-11:05	10:30-11:20
IV Hr	11:15-12:05	11:30-12:20
V Hr	12:15- 1:05	12:30- 1:20
VI Hr	1:30- 2:20	1:30- 2:20
VII Hr	2:30- 3:20	2:30- 3:20
VIII Hr	3:30- 4:20	3:30- 4:20
IX Hr	4:30- 5:20	4:30- 5:20

Convocation—Thursdays, IV Hour, University Armory

*Final examinations.*—Final examinations will be given during the last four days of the quarter. A detailed schedule will be published in the *Official Daily Bulletin*.

### CLASS SCHEDULE

*Other schools and colleges.*—For programs of classes given in other schools and colleges of the University, not listed below, send to the registrar, University of Minnesota, Minneapolis.

*Abbreviations.*—The following abbreviations are used to indicate names of buildings, those marked with an asterisk (\*) are located on the Minneapolis campus; all others are at University Farm.

A, *Armory	IA, *Institute of Anatomy
AB, *Animal Biology	MA, *Mechanic Arts
Ad, Administration	ME, *Main Engineering
BB, Beef Barn	MH, *Millard Hall
C, *Chemistry	MS, Meat Shop
Ch, Agricultural Chemistry	Mu, *Music
DB, Dairy Barn	P, *Pillsbury Hall
DH, Dairy Hall	Ph, *Physics
DiH, Dining Hall	PHP, *Public Health and Pathology
Ed, *Education	PP, Plant Pathology
En, Agricultural Engineering	Psy, *Psychology

FH, Farm House  
 F, \*Folwell Hall  
 G, \*Greenhouse  
 Gy, Gymnasium  
 HE, Home Economics  
 Hr, Horticulture

SS, Soil Survey  
 St, Stock Pavilion  
 UHS, \*University High School  
 Ve, Veterinary  
 WGm, \*Women's Gymnasium

*Explanation of course numbers.*—All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 100 to 200. The letters f (fall), w (winter), and s (spring), indicate the quarters in which the course is offered. For example: 5f,w,s indicates that Course 5 is a one-quarter course given in the fall and repeated in the winter and again in the spring; 10f-11w-12s indicates that Course 10-11-12 is a three-quarter course running through three quarters; 25f,w-26w,s indicates a two-quarter course given in the fall and winter quarters and repeated in the winter and spring quarters.

# PROGRAM

1922-23

## AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
2f	Quantitative Methods..... (5 cred.; jr., sr.; prereq., Chem. 10 cred.)	VI, VII, VIII, IX	MWF	7Ch	Mr. Willaman
3f,w,s†	Types of Carbon Compounds..... (6 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)	I	MTWThFS	201Ch	Mr. Anderson
7f-8w	General Agricultural Biochemistry... (10 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	II	TThS	201Ch	Mr. Anderson
	Lab.	VI, VII, VIII	MW	203Ch	Mr. Anderson
7w-8s	General Agricultural Biochemistry... (Same as 7f-8w)				
	Lect.	III	TThS	201Ch	Mr. Anderson
	Lab.	VI, VII, VIII	MF	203Ch	Mr. Anderson
15f,s	Principles of Animal Nutrition..... (3 cred.; jr., sr.; prereq., 7-8)	III	MWF	3St	Mr. Palmer
101f†-102w‡	Agricultural Quantitative Analysis... (6 cred.; jr., sr.; prereq., 7-8)	VI,VII,VIII	MWF	7Ch	Mr. Morrow
103s	Dairy Chemistry..... (5 cred.; jr., sr.; prereq., 7-8)				
	Lect.	VI	MWF	251Ch	Mr. Palmer
	Lab.	VII,VIII,IX	MWF	7Ch	Mr. Palmer
106f	Chemical Technology of Agricultural Products ..... (5 cred.; sr.; prereq., 101-102)	Ar	Ar	Ar	Mr. Bailey
108s‡	Chemistry of Wheat and Wheat Products ..... (3 cred.; jr., sr.; prereq., 3 or 7-8)	II	MWF	201Ch	Mr. Bailey
109s	Selected Flour Laboratory Methods.. (3 cred.; special students, see course descrip.; prereq., 101-102 or Chem. 131-132)	VI, VII, VIII, IX	MW	7Ch	Mr. Bailey
110s‡	Flour Laboratory Methods..... (5 cred.; jr., sr.; prereq., same as 109)	VI, VII, VIII, IX	MWF	7Ch	Mr. Bailey
111f†-112w‡	Phytochemistry ..... (6 cred.; sr.; prereq., Biol. 9 cred., org. chem.)	III	MWF	201Ch	Mr. Morrow
41w	Apprentice Teaching..... (Same as 41f)				
	Sec. 1	II	MWF	4Ad	Mr. Lathrop
	2*	VII	MTWThF**	UHS	Mr. Dickinson
41s	Apprentice Teaching..... (Same as 41f)	Ar	Ar	Ar	Mr. Field

† Offered also in the Summer Session.

‡ Offered also in the summer quarter (eleven weeks).

No.	Title	Hour	Day	Bldg.	Instructor
42f	Teaching ..... (3 cred.; jr., sr.;§   prereq., 41, Agron. 121, 122, 123) Sec. 1	I	MWF	317Ad	Mr. Field, Mr. Dickinson
	2	II	MWF	317Ad	Mr. Field
	3	III	MWF	4Ad	Mr. Dickinson
	4	IV	MWF	4Ad	Mr. Field
42W	Teaching ..... (Same as 42f) Sec. 1	I	MWF	317Ad	Mr. Field, Mr. Lathrop
	2	III	MWF	4Ad	Mr. Lathrop, Mr. Dickinson
	3	IV	MWF	317Ad	Mr. Field
	4	IV	MWF	4Ad	Mr. Lathrop
	5*	VII	MTWThF**	UHS	Mr. Dickinson
42S	Teaching ..... (Same as 42f)	Ar	Ar	Ar	Ar
63f-64w-65s	General Agriculture..... (9 cred.; no prereq.)	Ar	Ar	Ar	Mr. Storm, Mr. Mayne, Mr. Field
75W,S	Visual Presentation..... (3 cred.; jr., sr.; prereq., 11) Lect.	VIII	M	317Ad	Mr. Dickinson
	Lab.	VIII, IX	WF	317Ad	
81s	Extension Work..... (3 cred.; jr., sr.; prereq., 6 cred. in farm mgt., 6 cred. in farm crops, 15 cred in an. ind., 6 cred. in agr. educ.)	VI	MWF	317Ad	Mr. Storm
82f,w,s†	Agricultural Extension Field Course (3 to 10 cred.; jr., sr.; prereq., 81††)	Ar	Ar	Ar	Mr. Storm
113ff-114w‡	Biochemical Laboratory Methods.... (4 cred.; sr.; prereq., quant. anal., parallel 111-112)	VI, VII, VIII	TTh	7Ch	Mr. Morrow
116w	Advanced Animal Nutrition..... (2 cred.; jr., sr.; prereq., 15 or equiv.)	III	TTh	251Ch	Mr. Palmer, Miss Kennedy
117f,w,s‡	Laboratory Problems in Animal Nutri- tion ..... (3 to 5 cred.; jr., sr.; prereq., 116, instructor's permission)	Ar	Ar	Ar	Mr. Palmer, Miss Kennedy
118f,w,s‡	Laboratory Problems in Biochemistry (3 or 5 cred.; sr.; prereq. 111-112, 113-114; or 103 or 110)	Ar	Ar	Ar	Ar

\* Offered on Minneapolis campus.

\*\* For part of quarter only.

† Offered also during the Summer Session.

†† Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites to this course.

|| It may be possible for a limited number to take this course in the spring quarter. Approval of Mr. Field is required before registering.

§ Offered only to those preparing to teach.

¶ Registration limited. Students are admitted to this course only when approved by Mr. Field.



AGRICULTURAL ECONOMICS

See Economics, page 120.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
11f	Principles of Vocational Education.. (3 cred.; jr., sr.§; no prereq.)	I	MWF	24Ad	Mr. Dyer
11w	Principles of Vocational Education.. (Same as 11f)	II	TThS	307Ad	Mr. Dyer
11s	Principles of Vocational Education.. (Same as 11f)	I	MWF	317Ad	Mr. Dyer
21f	Vocational Education..... (3 cred.; jr., sr.§; no prereq.)	III	TThS	307Ad	Mr. Mayne
41f	Apprentice Teaching..... (2 cred.; jr., sr.§¶; prereq., 131)				
	Sec. 1	IV	MWF	317Ad	Mr. Dickinson
	2*	VII	MTWThF	UHS	Mr. Dickinson
121w	Teachers' Course, Home and School Gardening .....	Ar	Ar	Ar	Mr. Field
	(2 cred; prereq., division approval)				
131f,w,s‡	Methods in Teaching High School Agriculture .....	III	MTWThF	317Ad	Mr. Field
	(5 cred.; jr.,** sr.§; prereq., 11)				
151w,s	Organization and Management..... (5 cred.; sr.; prereq., 11, 21)	IV	MTWFS	317Ad	Mr. Storm, Mr. Dyer, Mr. Lathrop
153f,‡	Consolidated Rural Schools..... (3 cred.; jr., sr.; no prereq.§)	I	TThS	317Ad	Mr. Dyer
154f	Rural Education and Community Life (3 cred.; jr., sr.; no prereq.)	II	TThS	317Ad	Mr. Dyer
154w‡	Rural Education and Community Life (Same as 154f)	I	TThS	317Ad	Mr. Dyer
155s	Consolidated Rural School Problems (3 cred.; jr., sr.; prereq., 11, 153 or equiv.)	Ar	Ar	Ar	Mr. Dyer
161f-162w- 163s	Fundamentals of Agriculture..... (9 cred.; jr., sr.§; no prereq.)	Ar	Ar	Ar	Mr. Storm
164w‡	Fundamentals of Agriculture..... (3 cred.; consol. school princ.)	Ar	Ar	Ar	Mr. Field
176s‡	Advanced Visual Presentation..... (3 cred.; jr., sr.; prereq., 75)	Ar	Ar	Ar	Mr. Dickinson
181w	Agricultural Statistics and Graphic Representation .....	Ar	Ar	Ar	Ar
	(3 cred.; soph., jr., sr.; prereq., Farm Eng. 3, 11)				

\* Offered on Minneapolis campus.

\*\* Open to juniors on the approval of the chief of the division.

‡ Offered also in the summer quarter (eleven weeks)

§ Offered only to those preparing to teach.

¶ Registration limited. Students are admitted to this course only when approved by Mr. Field.

No.	Title	Hour	Day	Bldg.	Instructor
191f-192w-193s†	Seminar in Agricultural Education.. (6 cred.; sr.; prereq., Agr. Educ. 11 cred.)	Ar	Ar	Ar	Mr. Storm. Mr. Field, Mr. Dyer, Mr. Lathrop

## AGRONOMY AND FARM MANAGEMENT

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s†	Farm Crops..... (3 cred.; no prereq.)	III, IV	MWF	2Ad	Mr. Steinmetz
11s	Farm Machinery..... (3 cred.; jr., sr.; no prereq.)	VI, VII, VIII	WF	BAd	Mr. Bassett
101s	Farm Management I..... (3 cred.; jr., sr.; prereq., 1, Econ. 6)	II	TThS	24Ad	Mr. Pond
102f	Farm Management II: Organization.. (3 cred.; sr.; prereq., 1, Econ. 6, An. Husb. 6 or 8, Soils 5)	II	MWF	24Ad	Mr. Boss, Mr. Garey
102w	Farm Management II: Organization (Same as 102f)	I	MWF	24Ad	Mr. Boss, Mr. Garey
103w	Farm Management II: Operation.... (3 cred.; sr.; prereq., 102)	II	MWF	24Ad	Mr. Boss, Mr. Garey
103s†	Farm Management II: Operation.... (Same as 103w)	I	MWF	24Ad	Mr. Boss, Mr. Garey
104s	Farm Management III..... (3 cred.; sr.; prereq., 101, 102)	II	MWF	24Ad	Mr. Boss
121f	Cereal Crops..... (3 cred.; jr., sr.; prereq., 1) Sec. 1	VI, VII, VIII	TTh	2Ad	Mr. McGinnis
	2	VI, VII, VIII	WF	2Ad	
122w	Corn and Potato Crops..... (3 cred.; jr., sr.; prereq., 1) Sec. 1	VI, VII, VIII	TTh	2Ad	Mr. McGinnis
	2	I, II	TThS	2Ad	
123s	Forage and Fiber Crops..... (3 cred.; jr., sr.; prereq., 1) Sec. 1	VI, VII, VIII	TTh	2Ad	Mr. Arny Mr. Steinmetz
	2	I, II	MWF	2Ad	
131f	Principles of Genetics..... (3 cred.; jr., sr.; prereq., Bot. 9 cred., An. Biol. 9 cred.) Lect.	I	ThS	24Ad	Mr. Griffee
	Sec. 1 Lab.	I, II	T	24Ad	Mr. Beaumont
	2	III, IV	T	212Hr	
	3	VI, VII	W	212Hr	
132s†	Farm Crops Plant-Breeding..... (3 cred.; jr., sr.; prereq., 131)	I	ThS	24Ad	Mr. Hayes
133w	Judging and Grading Farm Crops... (3 cred.; jr., sr.; prereq., 121, 122)	I, II	T	4Ad	Mr. Griffee
			MWF	2Ad	Mr. Arny

† Offered also in the Summer Session.

‡ Registration limited. Students are admitted to this course only when approved by Mr. Field.

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## ANIMAL BIOLOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
9f-10w*	Histology ..... (10 cred.‡; soph., jr., sr.; prereq., 14-15-16)	III, IV	MTWFS	201,211AB	Mr. Downey
11s*	Cytology and Technique..... (5 cred.; soph., jr., sr.; prereq., 1-2 or 14-15-16)	III, IV	MTWFS	201,211AB	Mr. Nachtrieb
14f-15w-16s*	General Zoology, (Agr., For., and H. E.)..... (9 cred.¶; no prereq.)	VI, VII, VIII	TTh	101,313AB	Ar
17f*	General Physiology I..... (5 cred.; soph., jr., sr.; prereq., 14 cred. or 9 cred. and Chem. or Phys. 10 cred.)	VI, VII, VIII IX	MW F	10AB	Mr. Lund
18w*	General Physiology II..... (Same as 17f)	VI, VII, VIII IX	MW F	10AB	Mr. Lund
19s*	Principles of Animal Behavior..... (5 cred.; soph., jr., sr.; prereq., 14- 15-16 or 14-15 and Chem. Phys., or Psychol. 10 cred.)	VI, VII, VIII IX	MW F	10AB	Mr. Lund
37f-38w-39s*	General Entomology..... (9 cred.‡; soph., jr., sr.; prereq., 14-15-16)	I, II	MWF	202AB	Mr. Oestlund
44f*	Animal Parasites..... (3 cred.; prereq., 14-15-16)	VI, VII	MWF	202AB	Mr. Riley
44s*	Animal Parasites..... (Same as 44f)	VI, VII, VIII	WF	202AB	Mr. Riley
45	Relation of Insects to Disease..... (3 cred.; prereq. 1-2 or 14-15-16)	VI, VII, VIII	MW	208,210AB	Mr. Riley
46w-47s*	Ornithology ..... (6 cred.‡; jr., sr.; prereq., 14-15-16)	VI, VII, VIII	TTh	211 314AB	Mr. Roberts
48s*	General Ecology..... (5 cred.; prereq., 14-15-16)	VI, VII, VIII IX	MW F	204AB	Mr. Chapman
107s*	Protozoology ..... (3 cred.; jr., sr.; prereq., 14 cred. incl. 14-15-16)	I, II	MWE	211,213AB	Mr. Sigerfoos
109f-110w- 111s*	General Physiology..... (15 cred.‡; jr., sr.; prereq., 10 cred.)	VI, VII, VIII IX	MW F	10AB	Mr. Lund
117f-118w- 119s*	Ecology of Insects..... (9 cred.‡; jr., sr.; prereq., 43)	VI, VII, VIII	TTh	204AB	Mr. Chapman
124†*	Advanced Ecology..... (5 cred.; jr., sr.; prereq., 117-118- 119)	Ar	Ar	Ar	Ar
125f-126w- 127s*	Advanced Entomology..... (9 cred.‡; jr., sr.; prereq., 37-38-39 or 43)	III, IV	TThS	204AB	Mr. Oestlund

\* Offered on the Minneapolis campus.

† Offered also in the Summer Session.

‡ The full course must be completed before credit will be allowed.

¶ The full course must be completed before credit will be allowed except that students in Home Economics may receive credit for the first two quarters' work when Botany 8 has been satisfactorily completed.

No.	Title	Hour	Day	Bldg.	Instructor
130w*	Biology and Taxonomy of the Aphididae ..... (3 cred.; jr., sr.; prereq., 19 cred. incl. 14-15-16)	III, IV	MWF	204AB	Mr. Oestlund
139f-140w	Histology and Development of Insects ..... (6 cred.‡; jr., sr.; prereq., 37-38-39)	II, III, IV	TTh	324Ad	Mr. Riley
144f-145w-146s*	Animal Parasites and Parasitism.... (9 cred.‡; jr., sr.; prereq., 37-38-39)	VI, VII, VIII	WF	202AB	Mr. Riley
181f-182w*	Embryology ..... (6 cred.‡; jr., sr.; prereq., 11)	VI, VII	MWF	201,211AB	Mr. Nachtrieb
183s*	Genetics and Eugenics..... (3 cred.; jr., sr.; prereq., 14-15-16, 5 cred. in an. biol. or bot.)	VI	MWF	211AB	Mr. Nachtrieb

## ANIMAL HUSBANDRY

## ANIMAL INDUSTRY GROUP

No.	Title	Hour	Day	Bldg.	Instructor
2s	Livestock-Judging ..... (3 cred.; jr., sr.; prereq., 3-4 or 11-12)	III, IV	MWF	CSt	Mr. Anderson
3f-4w	Market Classes of Livestock..... (6 cred.; soph., jr., sr.; prereq., 1)	I I, II	M WF	WSt WSt	Mr. Ferrin Mr. Ferrin
5w	Livestock-Breeding ..... (3 cred.; jr., sr.; prereq., Agron. 131)	IV	MWF	3St	Mr. Peters
6w	Livestock-Feeding ..... (5 cred.; jr., sr.; prereq., Agr. Biochem. 15)	III	MTWFS	3St	Mr. Ferrin
7f	Meats ..... (3 cred.; sr.; prereq., 2, Agr. Biochem. 15)	VI, VII, VIII	TTh	MS	Mr. Anderson
8s	Fundamentals of Feeding..... (3 cred.; jr., sr.; prereq., Agr. Biochem. 15)	I	TThS	3St	Mr. Harvey, Mr. Rayburn
9s	Pedigrees and Herd Books..... (3 cred.; jr., sr.; prereq., 5)	II	TThS	3St	Mr. Ferrin
10f,w	Market Classes of Livestock..... (5 cred.; no prereq.)	I, II	MTWFS	CSt	Mr. Carnes
11f-12w	Types and Breeds of Livestock..... (6 cred.; soph., jr., sr.; prereq., 10)	Not offered in 1922-23			
101f	Advanced Stock-Judging..... (3 cred.; sr.; prereq., 2)	VII, VIII	MWF	CSt	Mr. Ferrin
102s	Horse Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)				
	Lect.	II	TTh	WSt	Mr. Peters
	Lab.	VI, VII, VIII	F	CSt	
103s	Beef Cattle Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)				
	Lect.	III	MW	WSt	Mr. Carnes
	Lab.	VI, VII, VIII	T	BB	

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be allowed.

104s	Sheep Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)	Lect. IV Lab. VI, VII, VIII	WF 3St M CSt	Mr. Anderson
105s	Swine Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)	Lect. III Lab. VI, VII, VIII	TS 3St Th CSt	Mr. Ferrin
106w	Advanced Meats..... (3 cred.; jr., sr.; prereq., 7)	VI, VII, VIII	WF MS	Mr. Anderson
107s	Meat Problems..... (3 cred.; sr.; prereq., 106)	Lect. IV Lab. VI, VII, VIII	TS MS W MS	Mr. Anderson
108s	Seminar ..... (3 cred.; sr.; prereq., 5, 6)	II	MWF 3St	Mr. Peters

## ANTHROPOLOGY AND AMERICANIZATION TRAINING

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Introduction to Anthropology..... (5 cred.; 3rd gr. fr., soph., jr., sr.; no prereq.)				
	Sec. 1	II	MWThFS	15F	Mr. Jenks
	2	VI	MTWThF	15F	Mr. Grace
1w*	Introduction to Anthropology..... (Same as 1f)	VI	MTWThF	15F	Mr. Grace
1s*	Introduction to Anthropology..... (Same as 1f) *				
	Sec. 1	II	MWThFS	15F	Mr. Grace
	2	VI	MTWThF	25F	Mr. Grace
4w*	Cultural Anthropology..... (3 cred.; soph., jr., sr.; prereq., 1)	* II	MWF	25F	Mr. Jenks
5f,w,s*	General Immigration..... (3 cred.; soph., jr., sr.; prereq., 1)	III	TThS	15F	Mr. Grace
12f,w,s	Ethnology ..... (3 cred.; soph., jr., sr.; prereq., 1)	II	TThS	25F	Miss Speaker
108s*	Philippine Peoples..... (3 cred.; jr., sr.; prereq., 3 courses)	II	MWF	25F	Mr. Jenks
112s*	The American Negro..... (3 cred.; jr., sr.; prereq., 3 courses)	IV	MWF	15F	Mr. Jenks
113f*	The Older Immigrants..... (3 cred.; jr., sr.; prereq., 3 courses)	III	MWF	15F	Mr. Jenks
114w*	The Newer Immigrants..... (3 cred.; jr., sr.; prereq., 3 courses)	III	MWF	15F	Mr. Jenks
115s*	Americanisms and Assimilation..... (3 cred.; jr., sr.; prereq., 3 courses)	III	MWF	15F	Mr. Jenks
117w*	The Immigrant Woman..... (3 cred.; jr., sr.; prereq., 3 courses)	II	TThS	15F	Miss Speaker
118f*	Government and the Immigrant..... (3 cred.; jr., sr.; prereq., 3 courses incl. 5)	IV	MWF	Ar	Mr. Grace

\* Offered on the Minneapolis campus.



No.	Title	Hour	Day	Bldg.	Instructor
120w*	The American Indian..... (3 cred.; jr., sr.; prereq., 3 courses incl. 12)	IV	MWF	25F	Mr. Grace
123w-124s*	Problems in Anthropology..... (6 cred.; jr., sr.; prereq., 3 courses)	Ar	Ar	Ar	Mr. Jenks

## ARCHITECTURE

## COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
21f-22w-23s*	Freehand Drawing..... (6 cred.; jr., sr.; no prereq.)				
	Sec. 1	II, III	MWF	401ME	Mr. Johnson
	2	VI, VII	MWF	401ME	Mr. Johnson

For additional courses see the bulletin of the College of Engineering and Architecture.

## ART EDUCATION

## COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
29f-30w- 31s*‡	Fundamental Principles of Design... (9 cred.; no prereq.)				
	Lect.	III	TThS	401,404F	Miss Raymond
	Sec. 1 Lab.	II	TThS	401,404F	Mrs. Hanley
	2	IV	TThS	401,404F	Miss Raymond
32Af-33Aw- 34As*	Still Life..... (3 cred.; no prereq.)				
	Sec. 1	I, II, III	M	401,404F	Miss Raymond
	2	II, III, IV	M	401,404F	Miss Raymond
32Bf-33Bw- 34Bs*	Composition ..... (3 cred.; no prereq.)				
	Sec. 1	I, II, III	W	401,404F	Miss Raymond
	2	II, III, IV	W	401,402F	Miss Raymond
32Cf-33Cw- 34Cs*	Sketch ..... (3 cred.; no prereq.)				
	Sec. 1	I, II, III	F	401,402F	Mrs. Martin
	2	II, III, IV	F	401,402F	Mrs. Hanley
	3	I	TThS	401,402F	Mrs. Hanley
40f-41w-42s*	Principles of Harmony in Form and Color ..... (9 cred.; soph., jr., sr.; prereq., 29- 30-31 or instructor's permission)				
	Lect.	II	TThS	406F	Miss Raymond
	Sec. 1 Lab.	I	TThS	406F	Miss Raymond
	2	III	TThS	406F	Miss Raymond

For additional courses see the bulletin of the College of Education.

\* Offered on the Minneapolis campus.

‡ Home Economics students with credit in H. E. 51 and 53 will be admitted to the last quarter of the course.

## BACTERIOLOGY AND IMMUNOLOGY

## MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
1f-w-s*†	General Bacteriology..... (5 cred.; soph., jr., sr.; prereq., Chem. 10 cred. and Biol. 10 cred.)	VI, VII, VIII	MWF	MH	Ar
103w*	Special Bacteriology for Students of Agriculture .....	III, IV	TS	MH	Ar
	(4 cred.; jr., sr.; prereq., 1)	IV	Th	MH	Ar
105f*	Household Bacteriology..... (3 cred.; jr., sr.; prereq., 1)	VII, VIII	TTh	MH	Ar

## BEE CULTURE

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s†	Elementary Bee Science..... (3 cred.; no prereq.)				
	Sec. 1	III	MWF	FH	Mr. Jager
	2	III	TThS	FH	
2f,w,s†	Industrial Beekeeping .....				
	(3 cred.; prereq., 1)				
	Sec. 1 Lect.	IV	MW	FH	Mr. Jager
	Lab.	IV	F	FH	
		One additional hour to be arranged			
	2 Lect.	IV	TS	FH	
	Lab.	Two additional hours to be arranged			
3s§	Advanced Beekeeping..... (3 cred.; prereq., 1, 2)				
	Lect.	VII	MW	FH	Mr. Jager
	Lab.	VII	F	FH	
		One additional hour to be arranged			
4††	Queen-Raising .....	....	....		Mr. Jager
	(5 cred.; prereq., 1, 2, 3)				
5††	Bee Diseases.....	....	....		Mr. Jager
	(3 cred.; prereq., 1, 2, 3)				
6f§	Bee Products.....				
	(3 cred.; prereq., 1, 2, 3)				
	Lect.	VI	MW	FH	Mr. Jager
	Lab.	VI	F	FH	
		One additional hour to be arranged			

## BOTANY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Botany..... (10 cred.; no prereq.)				
	Sec. 1 Lab.	I, II	MWF	212, 214, 220P	Mr. Durand in charge
	Quiz	I	T	212, 214, 220P	
	Lect.	II	TThS	210P	
	2 Lab.	VI, VII	MWF	212, 214, 220P	
	Quiz	VII	Th	212, 214, 220P	
	Lect.	VI, VII	T	210P	
		VI	Th	210P	

For additional courses see the bulletin of the Medical School.

\* Offered on the Minneapolis campus.

† Offered also in the Summer Session.

†† Offered only in the Summer Session provided a sufficient number of students register.

§ Offered provided a sufficient number of students register.

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s*	General Botany..... (Same as 1f-2w)				
	Lab.	III, IV	MWF	212,214,220P	Mr. Durand in charge
	Quiz	IV	T	212,214,220P	
	Lect.	III	TThS	210P	
1s-2f*	General Botany..... (Same as 1f-2w)				
	Lab.	I, II	TThS	212,214,220P	Mr. Durand in charge
	Quiz	I	W	212,214,220P	
	Lect.	II	MWF	210P	
4f-5w-6s*	General Botany..... (9 cred.; students in Agr. and For.)				
	Lect.	VIII	TTh	212,214,220P	Mr. Durand
	Lab.	VI, VII	TTh	212,214,220P	
7s*	Taxonomy of Flowering Plants..... (5 cred.; prereq., 2, 5, or 8)				
	Lect.	VI	MWF	212,214,220P	Mr. Rosen- dahl, Mr. Johnson
	Lab.	VII, VIII, IX	MF	210P	
8s*	General Botany..... (5 cred.; students in H. E.; no prereq.)				
	Lect.	II	TThS	210P	Mr. Durand
	Lab.	I, II	MWF	212,214,220P	
12f*	General Morphology of Algae..... (3 cred.; prereq., 2 or 6)	I, II	TThS	213AB	Miss Tilden
13w*	General Morphology of Fungi..... (3 cred.; prereq., 2 or 6)	I, II	TThS	213AB	Mr. Johnson
20f*	Forest Ecology..... (3 cred.; soph., jr., sr.; prereq., 2 or 5, and For. 1)	I, II, III	TTh	G	Mr. Cooper
21s*	Elementary Ecology..... (5 cred.; prereq., 2 or 5)	III, IV	MTWFS	G	Mr. Cooper
22f,s*	Elementary Plant Physiology..... (5 cred.; prereq., 2 or 5, org. chem. advised)	III, IV	MTWFS	G	Mr. Knight
48f*	Plant Industry..... (5 cred.; jr., sr.; no prereq.)	VIII	MTWThF	Ar	Mr. Rosendahl, Mr. Freeman
51f*	Histological Methods..... (3 cred.; jr., sr.; prereq., 15 cred.)	I, II	MWF	213AB	Mr. Rosendahl
62w*	General Morphology of Bryophytes and Pteridophytes..... (3 cred.; jr., sr.; prereq., 15 cred.)	VI, VII, VIII	TTh	Ar	Mr. Huff
63s*	General Morphology of Gymnosperms and Angiosperms..... (3 cred.; jr., sr.; prereq., 7 or 62)	VI, VII, VIII	TTh	Ar	Mr. Butters
107w*	Morphology and Taxonomy of the Bryophytes..... (5 cred.; jr., sr.; prereq., 7, 62)	Ar	Ar	106AB	Mr. Durand
108w*	Morphology and Taxonomy of the Pteridophytes..... (5 cred.; jr., sr.; prereq., 7, 62)	Ar	Ar	4AB	Mr. Butters

\* Offered on the Minneapolis campus.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
110w*	Morphology and Taxonomy of the Gymnosperms ..... (5 cred.; jr., sr.; prereq., 7, 63)	Ar	Ar	4AB	Mr. Butters
113f-114w- 115s*	Advanced Taxonomy..... (9 cred.; jr., sr.; prereq., 15 cred. incl. 7)	VI, VII	MWF	213AB	Mr. Rosendahl
118w*	Cytology ..... (3 cred.; jr., sr.; prereq., 18 cred.)	VI, VII, VIII	TTh	213AB	Mr. Rosendahl
127s*	Anatomy of Vascular Plants..... (5 cred.; jr., sr.; prereq., 18 cred.)	III, IV	MTWFS	G	Mr. Cooper
131f*	Field Ecology..... (5 cred.; jr., sr.; prereq., 20 or 21)	Ar	Ar	G	Mr. Cooper
132w*	Ecological Anatomy..... (5 cred.; jr., sr.; prereq., 21)	III, IV	MTWFS	G	Mr. Cooper
133s*	Forest Geography of North America (5 cred.; jr., sr.; prereq., 21)	VI, VII	MWF	G	Mr. Cooper
141f*	Physical Phases of Plant Physiology (5 cred.; jr., sr.; prereq., 22, org. chem. advised)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey, Mr. Farabaugh
142w*	Plant Metabolism..... (5 cred.; jr., sr.; prereq., same as 141)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey, Mr. Farabaugh
143s*	Plant Metabolism and Growth..... (5 cred.; jr., sr.; prereq., same as 141)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey, Mr. Farabaugh
144s*	Plant Microchemistry..... (5 cred.; jr., sr.; prereq., same as 141)	III, IV	MTWFS	G	Mr. Harvey

## CHEMISTRY

### SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Inorganic Chemistry..... (8 cred.; no prereq.)				
	Lect.	VII	MWF	100C	
	Lab.	VIII, IX	MW	210C	
3s*	General Inorganic Chemistry..... (4 cred.; prereq., 1-2)				
	Lect.	VII	MF	100C	
		IV	S	100C	
	Lab.	VIII, IX	MF	210C	
9f-10w*	General Inorganic Chemistry..... (10 cred.; prereq., 1 yr. h. s. chem.)				
	Lect.	VII	MWF	100C	
	Lab.	VIII, IX	MWF	210C	
11f*	Qualitative Chemical Analysis..... (4 cred.; prereq., 3)				
	Lect.	IV	MWF	225C	Miss Cohen
	Lab.	VI, VII	MW	290C	Miss Cohen

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
115*	Qualitative Chemical Analysis..... (Same as 11f)				
	Lect.	VI	MWF	100C	Mr. Henderson, Mr. Fosse
	Lab.	VI, VII or VIII, IX	TTh	210C 210C	
12f*	Qualitative Chemical Analysis..... (5 cred.; prereq., 9-10)				
	Lect.	II	TThS	Ar	Ar
	Lab.	VI, VII, VIII	MW	Ar	Ar
125*	Qualitative Chemical Analysis..... (Same as 12f)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I, II, III	ThS	210C	Mr. Sneed
13f*	Qualitative Chemical Analysis..... (5 cred.; prereq., 12)				
	Lect.	II	TTh	325C	Mr. Sneed
	Lab.	VI, VII, VIII	MWF	290C	Mr. Sneed
13w*	Qualitative Chemical Analysis..... (Same as 13f)				
	Lect.	II	TTh	ArC	Mr. Fosse
	Lab.	VI, VII, VIII	MWF	290C	Mr. Fosse
20w-215*	Quantitative Analysis..... (10 cred.; soph., jr., sr.; prereq., 12, 13)				
	Lect.	VI	M	325C	Mr. Geiger
	Rec.	VI	F	315C	Mr. Geiger
	Lab.	VII, VIII, IX	MF	310C	Mr. Sidener, Mr. Geiger
		VI, VII, VIII, IX	W	310C	Mr. Sidener, Mr. Geiger
35f-36w*	Organic Chemistry..... (10 cred.†; jr., sr.; prereq., 15 cred. in chem.)				
	Lect.	III	MWF	325C	Mr. Hunter
	Lab.	VI, VII, VIII	TTh	390C	Mr. Hunter
	Rec.	III	Th	C	Mr. Lauer
140f-141w-142s*	Physical Chemistry..... (9, 12, or 15 cred.†; jr., sr.; prereq., 2 yrs. chem., 1 yr. physics)				
	Lect.	IV	MWF	325C	Mr. MacDougall
	Lab.	VI, VII, VIII	F	117C	Mr. MacDougall
	Rec.	IV	S	115C	Ar

For additional courses see the bulletin of the School of Chemistry.

\* Offered on the Minneapolis campus.

† Offered in the Summer Session.

‡ Offered also during the Summer Session.



# CIVIL ENGINEERING

## COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
53s*	Municipal Engineering..... (3 cred., jr., sr.; no prereq.)	III	MWF	ME	Mr. Bass

For additional courses see the bulletin of the College of Engineering and Architecture.

# DAIRY HUSBANDRY

## ANIMAL INDUSTRY GROUP

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Elements of Dairying..... (5 cred.; no prereq.) (Limited to 45)				
	Lect.	III	TWS	39DH	Mr. Keithley
	Lab.	III, IV	MF	LabDH	Mr. Dahle, Mr. Anderson
2w	Dairy Bacteriology..... (5 cred.; soph., jr., sr.; prereq., Bact. 1) (Limited to 12)	VI,VII,VIII	MWF	40DH	Mr. Macy
2s	Dairy Bacteriology..... (Same as 2w) (Limited to 12)	I, II, III	MWF	40DH	Mr. Macy
4†	Cheese Factory Practice..... (3 cred.; jr., sr.; prereq., 1)	....	....	....	Mr. Keithley
5†	Creamery Practice..... (3 cred.; jr., sr.; prereq., 1)	....	....	....	Mr. Keithley
6f	Judging Dairy Cattle..... (1 cred.; jr., sr.; prereq., An. Husb. 1)	VI, VII, VIII	Th	DB	Mr. Rayburn
101f	Milk Production..... (5 cred.; jr., sr.; prereq., 1)	IV	MTWFS	39DH	Mr. Eckles
102s	Market Milk..... (3 cred.; jr., sr.; prereq., 1, 2)	IV II, III	MW Th	39DH 39DH	Mr. Keithley, Mr. Macy
103w	Dairy Stock-Feeding..... (3‡ cred.; sr.; prereq., 101, Agr. Bio-chem. 15)	III	MWF	32DH	Mr. Eckles
104s	Advanced Study of Dairy Breeds.... (3 cred.; jr., sr.; prereq., 6, 101)	VI, VII, VIII VI	MW F	40DH 40DH	Mr. Rayburn Mr. Rayburn
105f	Seminar I..... (1 cred.; sr.; prereq., 3 courses in Dy. Husb.)	II	S	32DH	Mr. Eckles
106w	Seminar II..... (Same as 105f)	II	S	32DH	Mr. Eckles
107s	Seminar III..... (Same as 105f)	II	S	32DH	Mr. Eckles
111f	Dairy Products I..... (3 cred.; jr., sr.; prereq., 1, 2)	I II, III	MW Th	39DH 39DH	Mr. Keithley, Mr. Dahle
112s	Dairy Products II..... (3 cred.; jr., sr.; prereq., 1, 2)	IV VI, VII	TF T	39DH 39DH	Mr. Keithley, Mr. Dahle, Dr. Dahle

\* Offered on the Minneapolis campus.

† Offered in the Summer Session.

‡ Only two credits allowed those who have completed Animal Husbandry 8.

## ECONOMICS

## SCHOOL OF BUSINESS

No.	Title	Hour	Day	Bldg.	Instructor
5f†	Principles of Economics (Agriculture and Forestry).....	II	MTWThF	251Ch	Ar
	(5 cred.; soph., jr., sr.; no prereq.)				
5w	Principles of Economics (Agriculture and Forestry).....				
	(Same as 5f)				
	Sec. 1	I	MTWThF	215En	
	2	II	MTWThF	215En	
	3	III	MTWThF	4PP	
5s	Principles of Economics (Agriculture and Forestry) .....	III	MTWThF	307Ad	
	(Same as 5f)				
5w,s	Principles of Economics (Home Economics) .....	II	MTWThF	203HE	Ar
	(Same as 5f)				
6f‡	Agricultural Economics.....	II	TThS	307Ad	Ar
	(3 cred.; soph., jr., sr.; prereq., 3-4 or 5)				
6w,	Agricultural Economics.....				
	(Same as 6f)				
	Sec. 1	I	TThS	1PP	
	2	III	TThS	1PP	
13f	Agricultural Statistics.....				
	(5 cred.; soph., jr., sr.; prereq., 3-4 or 5)				
	Lect.	III	TThS	1PP	Mr. Working
	Lab.	VI, VII	TTh	4Ad	
20s	Economic Geography of Agriculture..	IV	MTWFS	307Ad	Mr. Black, Mr. Holmes
	(5 cred.; no prereq.)				
21w	Economic History of Agriculture....	IV	MTWFS	215En	Mr. Price
	(5 cred.; no prereq.)				
25f-26w*	Principles of Accounting.....				Mr. Heilman in charge
	(8 cred.‡; soph., jr., sr.; prereq., 3-4 or 5 or parallel)				
	Sec. 1 Lect.	I	MWF	301MA	
	2	II	MWF	301MA	
	3	II	MWF	303MA(f)	
	4	III	MWF	301MA	
	5	IV	MWF	301MA	
	6	V	MWF	301MA	
	7	I	TThS	301MA	
	8	II	TThS	301MA	
	9	III	TThS	301MA	
	10	VI	MWF	301MA	

\* Offered on the Minneapolis campus.

† Offered also in the Summer Session.

‡ The full course must be completed before credit will be given.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
	Sec. 1. Lab.	VI, VII	M	303MA	
	2	VII, VIII	M	301MA	
	3	III, IV	T	303MA	
	4	I, II	T	303MA	
	5	VII, VIII	T	301MA	
	6	VIII, IX	T	303MA	
	7	VI, VII	W	303MA	
	8	VII, VIII	W	301MA	
	9	II, III	Th	303MA	
	10	VII, VIII	Th	301MA	
	11	VI, VII	Th	303MA	
	13	VI, VII	F	303MA	
	14	VII, VIII	F	301MA	
	15	III, IV	F	303MA	
	16	III, IV	S	303MA	
	18	VIII, IX	W	303MA	
25w-26s*	Principles of Accounting.....				
	(Same as 25f-26w)				
	Sec. 1 Lect.	II	MWF	303MA	Mr. Heilman
	2	I	TThS	301MA(w)	Mr. Heilman
				303MA(s)	
	3	III	MWF	102MA	
	4	IV	MWF	209MA(w)	
				303MA(s)	
	5	VI	MWF	109MA(w)	
				303MA(s)	
	Sec. 1 Lab.	VI, VII	T	303MA	Mr. Heilman
					in charge
	2	III, IV	W	303MA(w)	
				301MA(s)	
	3	VIII, IX	M	303MA	
	4	VIII, IX	M	Ar	
	5	II, III	S	Ar	
	6	VII, VIII	F	Ar	
28f,s	Principles of Accounting.....				
	(5 cred.; soph., jr., sr.; in Agr., For., and H. E. only; prereq., 3-4 or 5)				
	Lect.	III	MWF and	4PP	
		VII	Th	24Ad	Mr. Heilman, Mr. Miller
	Lab.	VIII, IX	Th	24Ad	Mr. Heilman, Mr. Miller
50s	Farm Finance.....	II	MWF	307Ad	Mr. Dowrie
	(3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)				
73w*	Railway Traffic and Rates.....	VI	MWF	213MA	Mr. Cummings
	(3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)				
85f,s	Principles of Marketing.....	II	TThS	1PP	Mr. Price, Mr. Anderson
	(3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)				
90s	Economics of Consumption.....	IV	MWF	4PP	Mr. Garver
	(3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)				

\* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
91w	Principles of Organization and Management .....	I	TThS	209MA	Ar
	(3 cred.; jr., sr.; prereq., 3-4 or 5)				
91s	Principles of Organization and Management .....	I	MWF	209MA	Ar
	(Same as 91w)				
103f-104w*	Value and Distribution.....				
	(6 cred.‡; jr., sr.; prereq., 3-4 or 5 and 6)				
	Sec. 1	I	MWF	102MA	Mr. Garver
	2	II	MWF	102MA	Mr. Garver
	3	VII	MWF	Ar	Mr. Working
106w	Land Economics.....	VI‡	MWF	307Ad	Mr. Black
	(3 cred.; jr., sr.; prereq., see footnote §)				
106s*	Land Economics.....	VII, VIII	TTh	202MA	Mr. Black
	(Same as 106w)				
107s	Land Tenure.....	VII	MWF	307Ad	Mr. Black
	(3 cred.; jr., sr.; prereq., 106)				
108w	Marketing of Farm Products.....	I	TThS	323Ad	Mr. Price, Mr. Anderson
	(3 cred.; jr., sr.; prereq., 85)				
110s-111f	Practice Course in Marketing.....	Ar	Ar	Ar	Mr. Price
	(3 cred.; jr., sr.; prereq., 25-26 or 28, 85, 108)				
112f*	Business Statistics.....	II	TThS	202MA	Mr. Mudgett
	(3 cred.; jr., sr.; prereq., 13 or 14)				
113w*	Theory of Statistics.....	II	TThS	213MA	Mr. Mudgett
	(3 cred.; jr., sr.; prereq., 13 or 14)				
116f	Economics of Agricultural Production .....	I	TThS	310En	Mr. Black
	(3 cred.; jr., sr.; prereq., see footnote §)				
116w	Economics of Agricultural Production	III	TThS	307Ad	Mr. Black
	(Same as 116f)				
117w	Prices of Farm Products.....	II	TThS	1PP	Mr. Working
	(3 cred.; jr., sr.; prereq., see footnote §)				
126f	Principles of Coöperation.....	III	MWF	251Ch	Mr. Black, Mr. Miller
	(3 cred.; jr., sr.; prereq., 85 or see footnote §)				
127w-128s	Marketing Organization and Management .....	III	MWF	251Ch	Mr. Black, Mr. Miller
	(6 cred.; jr., sr.; prereq., 25-26 or 28, 85)				
131f-132w-133s*	Cost Accounting.....				
	(9 cred.; jr., sr.; prereq., 25-26)				
	Sec. 1	II	TThS	109MA	Mr. Noble
	2	III	TThS	109MA	Mr. Noble
143f-144w*	The Financial System.....				
	(8 cred.‡; jr., sr.; prereq., 3-4 or 5 and 6)				
	Lect.	IV	T		Mr. Dowrie, Mr. Ebersole, Mr. Stehman

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

§ Senior classification, or 13 credits in economics and farm management, and 5 credits in other social sciences (political science, sociology, or history).

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
	Sec. 1	II	TThS	311F	
	2	III	MWF	202MA	
	3	II	MWF	109MA	
	4	VIII	MTW	209MA	
	5	VI	MWF	209MA	
	6	III	TThS	209MA	
145S*	Foreign Exchange.....	II	TThS	102MA	Mr. Myers
	(3 cred.; jr., sr.; prereq., 143-144)				
149S*	Business Cycles.....	VIII	MTW	209MA	Mr. Ebersole
	(3 cred.; sr.; prereq., 143-144)				
150S	Advanced Farm Finance.....	Ar	Ar	Ar	Mr. Dowrie
	(3 cred.; sr.; prereq., 143-144)				
155S*	Corporation Finance.....				
	(3 cred.; jr., sr.; prereq., 143-144)				
	Lect.	III	S	LitTh	Mr. Stehman
	Sec. 1 Lab.	II	TTh	109MA	
	2	III	TTh	102MA	
	3	III	MW	202MA	
	4	IV	MW	209MA	
	5	VI	TTh	213MA	
	6	VII	TTh	102MA	
167W*	Industrial Relations.....	II	TThS	209MA	Ar
	(3 cred.; jr., sr.; prereq., 161)				
168S*	Personnel Management.....	II	TThS	209MA	Ar
	(3 cred.; jr., sr.; prereq., 167)				
176f*	Commercial Policies.....	I	MWF	202MA	Mr. Blakey
	(3 cred.; jr., sr.; prereq., 3-4, or 5 and 6)				
177W*	Foreign Trade.....	I	MWF	202MA	Mr. Blakey
	(3 cred.; jr., sr.; prereq., 176)				
180f-181w-182s	Senior Seminar in Economics.....	Ar	Ar	Ar	Ar
	(9 cred.; sr.; prereq., see footnote §)				
191f-192w*	Public Finance.....	III	MWF	209MA	Mr. Blakey
	(6 cred.‡; jr., sr.; prereq., 3-4 or 5 and 6)				
193S*	State and Local Taxation.....	III	MWF	209MA	Mr. Blakey
	(3 cred.; jr., sr.; prereq., 191-192)				

## EDUCATIONAL ADMINISTRATION AND SUPERVISION

### COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
119W*	The Elementary School Curriculum..	I	MWF	Ar	Mr. Neale
	(3 cred.; sr.; prereq., 1 or 101-102-103, 3)				

For additional courses see the bulletin of the College of Education.

## EDUCATIONAL PSYCHOLOGY

### COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
55f,s*	Educational Psychology.....				
	(3 cred.; soph., jr., sr.; prereq., Psychology 6 cred.)				
	Sec. 1	I	MWF	Psy	
	2	I	TThS	Psy	

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

§ Senior classification or 13 credits in economics and farm management, and 5 credits in other social sciences (political science, sociology, or history).



No.	Title	Hour	Day	Bldg.	Instructor
55w*	Educational Psychology..... (See 55f,s)	I	MWF	Psy	
106f-107w- 108s*	Advanced Educational Psychology... (9 cred.; jr., sr.; prereq., 45 or equiv.)	III	MWF	Psy	Mr. Van Wagenen
111s*	Educational Diagnosis..... (3 cred.; jr., sr.; prereq., 45 or equiv.)	II	MWF	Psy	Mr. Van Wagenen

For additional courses see the bulletin of the College of Education.

## ENGLISH

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	General Survey of English Literature (9 cred.; soph., jr., sr.; prereq., Rhet. 1, 2, 3)				
	Sec. 1 Lect.	II	M	Ar	Ar
	Rec.	II	WF	114F	Ar
	2 Lect.	VII	T	Ar	Ar
	Rec.	VII	MF	205F	Ar
6f*	Chaucer ..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)	VII	MWThF	204F	Mr. Malone
6w*	Chaucer ..... (Same as 6f)	IV	MWFS	205F	Ar
6s*	Chaucer ..... (Same as 6f)	II	TWFS	204F	Mr. Malone
8f,w*	Shakespeare ..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)				
	Sec. 1	I	TWFS	204F	Mr. Stoll
	2	VI	MTThF	204F	Mr. Stoll
8s*	Shakespeare ..... (Same as 8f,w)				
	Sec. 1	I	TWFS	204F	Ar
	2	IV	MWFS	204F	Ar
40f*	Bible as Literature..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)	Not offered in 1922-23			
41s*	Browning and Tennyson..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)				
	Lect.	III	MW	301F	Mr. Burton
	Sec. 1 Rec.	III	F	301F	
	3	III	Th	Ar	
	4	II	T	301F	
	5	IV	T	Ar	
	6	VI	T	Ar	
44f-45w*	American Literature..... (6 cred.‡; soph., jr., sr.; prereq., 1-2-3 or parallel)	IV	MWF	301F	Mr. Moore

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
51f*	Spenser ..... (3 cred.; jr., sr.; prereq., 1-2-3)	Not offered in 1922-23			
53f*	Seventeenth-Century Lyrist..... (4 cred.; jr., sr.; prereq., 1-2-3)	III	MTWF	204F	Mr. Moore
58w-59s*	Nineteenth-Century Prose..... (6 cred.; jr., sr.; prereq., 1-2-3)	II	TThS	205F	Mr. Beach
62w*	Milton ..... (4 cred.; jr., sr.; prereq., 1-2-3)	VII	MTWF	204F	Mr. Stoll
64s*	Bacon ..... (3 cred.; jr., sr.; prereq., 1-2-3)	Not offered in 1922-23			
66s*	English Novel..... (4 cred.; jr., sr.; prereq., 1-2-3)				
	Lect.	IV	MWF	301F	Mr. Burton
	Sec. 1 Rec.	IV	T	301F	
	2	III	T	205F	
	3	IV	S	301F	
	4	III	S	205F	
70s*	Masterpieces of Elizabethan Drama.. (4 cred.; jr., sr.; prereq., 8)	VII	MTWF	204F	Mr. Stoll

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VIII	WF	306Ad	Mr. Ruggles
4f	Economic Vertebrate Entomology.... (3 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Mr. Washburn
6w	Insects of Forest Products..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	I, II	MWF	306Ad	Mr. Graham
7s	General Forest Entomology..... (1 cred.; soph., jr., sr.; prereq., 6)	Given at Itasca Park			Mr. Graham
8f	Varieties and Habits of Fur-Bearing Animals ..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Ar
12w	Forest Zoology..... (3 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Mr. Washburn
20w	Home Economic Entomology..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 6 cred.)	VI, VII, VIII	TTh	306Ad	Mr. Riley, Mr. Ruggles
37f-38w-39s*	General Entomology..... (9 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	I, II	MWF	202AB	Mr. Oestlund
44f,s	Introductory Course in Animal Parasites and Parasitism..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VIII	WF	324Ad	Mr. Riley

\* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
117f-118w-119s*	General Ecology of Insects..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	VI, VII, VIII	TTh	204AB	Mr. Chapman
125f-126w-127s*	Advanced General Entomology..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV	TThS	204AB	Mr. Oestlund
130w*	Biology and Taxonomy of Aphididae (5 cred.; sr.; prereq., 37-38-39 or equiv.)	III, IV	MWF	204AB	Mr. Oestlund
139f-140w*	Histology and Development of Insects (6 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV	MWF	208, 210AB	Mr. Riley
144f-145w-146s*	Animal Parasites and Parasitism.... (3 to 9 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VII	WF	202AB	Mr. Riley
150f†	Insecticides and Their Action..... (3 or 6 cred.; jr., sr.; prereq., 37-38-39, Agr. Biochem. 7-8, or equiv.)	Ar	Ar	Ar	Ar
197f,w,s†	Introduction to Research..... (5 or more cred.; sr.; prereq., 37-38-39 or 44-45 and other work as prescribed by the division)	Ar	Ar	Ar	Mr. Oestlund, Mr. Ruggles, Mr. Chapman, Mr. Riley, Mr. Washburn

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### FARM ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
3f,s	Mechanical Drawing..... (2 cred.; no prereq.)	III, IV	MWF	303En	Mr. Jacobson
4s	Blacksmithing .....	VI, VII, VIII	TTh	20En	Mr. Johnston
5f	Framing and Building Construction. (3 cred.; no prereq.)	I, II	TThS	48En	Mr. White
7w	Farm Structures..... (3 cred.; jr., sr.; prereq., 3)				
	Lect.	IV	TS	305En	Mr. White
	Lab.	VII, VIII, IX	M	305En	Mr. White
8f,w	Farm Engineering..... (5 cred.; no prereq.)	I	MTWFS	107En	Mr. Boss
11f,w,s	Applied Mathematics..... (5 cred.; no prereq.)	III	MTWFS	215En	Mr. Roe
13w	Farm Motors I..... (3 cred.; no prereq.)	III, IV	MWF	Ar	Mr. Torrance
13s	Farm Motors I..... (Same as 13f)	VI, VII, VIII	MF	Ar	Mr. Torrance
14s	Farm Motors II..... (3 cred.; prereq., 13)	VI, VII, VIII	TTh	Ar	Mr. Torrance
17s	Advanced Blacksmithing..... (2 cred.; no prereq.)	VI, VII, VIII	WF	20En	Mr. Johnston
18f	Surveying .....	1:15-5:20	MWF	215En	Mr. Roe
	(5 cred.; jr., sr.; prereq., 3, 11, or equiv.)				

\* Offered on the Minneapolis campus.

† Offered also during the Summer Session.

‡ Open also to sophomores in Forestry.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
23f	General Physics..... (5 cred.; no prereq.)				
	Lect.	III	TThS	101En	Mr. Stewart
	Sec. 1 Lab.	I, II	TS	102En	Mr. Tyler
	2	VI, VII	TTh	102En	Mr. Tyler
23s	General Physics..... (Same as 23f)				
	Sec. 1 Lect.	III	TThS	101En	Mr. Stewart
	2	IV	MWF	101En	Mr. Stewart
	Sec. 1 Lab.	I, II	WF	102En	Mr. Tyler
	2	I, II	TS	102En	Mr. Tyler
	3	VI, VII	TTh	102En	Mr. Tyler
	4	VI, VII, VIII			
		IX	M	102En	Mr. Tyler
	5	VI, VII, VIII, IX	F	102En	Mr. Tyler
24w	Agricultural Physics I..... (4 cred.; prereq., 8, 11, 23, or equiv.)				
	Lect.	III	MWF	101En	Mr. Stewart
	Lab.	VI, VII, VIII	T	103En	Mr. Stewart
25s	Agricultural Physics II..... (4 cred.; prereq., 24)				
	Lect.	III	MWF	101En	Mr. Stewart
	Lab.	VI, VII, VIII	T	103En	Mr. Stewart
28w	Land-Clearing ..... (3 cred.; jr., sr.; no prereq.)	I	TThS	Ar	Mr. Thompson, Mr. Schwantes
31s	Principles of Drainage..... (5 cred.; jr., sr.; prereq., 3, 11, or equiv.)	1:15-5:20	MWF	215En	Mr. Roe, Mr. Elliott
34w	Household Mechanics and Heat.... (4 cred.; prereq., 23 or equiv.)	I, II	MWF	103En	Mr. Stewart
35s	Household Electricity and Light..... (4 cred.; prereq., 34)	I, II	MWF	101,103En	Mr. Stewart
37s	Rural Sanitation..... (3 cred.; jr., sr.; prereq., Farm Eng. 8)	I	TThS	101En	Mr. Stewart
38s	Advanced Mechanical Drawing..... (2 cred.; jr., sr.; prereq., 3, Arch. 21-22-23)	VI, VII, VIII	TTh	303En	Mr. Jacobson
40f,s	Mechanical Training..... (3 cred.; no prereq.)	I, II	MWF	106En	Mr. Dent
101s	Advanced Drainage..... (3 cred.; sr.; prereq., 31)	Ar	Ar	Ar	Mr. Roe
136f	Experimental Physical Analyses..... (5 cred.; jr., sr.; prereq., 25)	Not offered in 1922-23			Mr. Stewart

## FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,s	General Forestry..... (4 cred.; no prereq.)	II	MTWF	302Hr	Mr. Cheyney
2†	Elementary Dendrology..... (2 cred.; no prereq.)				Mr. Wentling

† Offered only during the Summer Session at Itasca Park.

No.	Title	Hour	Day	Bldg.	Instructor
3w	Dendrology ..... (3 cred.; soph., jr., sr.; prereq., Bot. 4)				
	Lect.	I	TThS	301Hr	Mr. Wentling
4s	Dendrology ..... (5 cred.; soph., jr., sr.; prereq., 3)				
	Lect.	I	TThS	301Hr	Mr. Wentling
	Lab.	II, III, IV	T	301Hr	Mr. DeFlon
5†	Elementary Silviculture..... (2 cred.; no prereq.)	II, III	Th	301Hr	Mr. Wentling
9†	Elementary Mensuration..... (2 cred.; no prereq.)				Mr. Allison
10w	Forest Mensuration..... (5 cred.; jr., sr.; prereq., 3-4)	IV	MTWFS	302Hr	Mr. Hansen
11f	Forest Valuation..... (5 cred.; jr., sr.; prereq., 10, 41)	I	MTWThF	302Hr	Mr. Allison
20w	Grazing ..... (3 cred.; jr., sr.; no prereq.)	III	TThS	302Hr	Mr. Allison
23††	Factory Experience..... (3 to 5 cred.; jr., sr.; prereq., 33-34)				
26f,w	Tree Crops..... (1 cred.; not open to students in For- estry; no prereq.)	IV‡	TS	307Ad	Mr. Cheyney
27w	Groves and Windbreaks..... (3 cred.; no prereq.)	I	MWF	301Hr	Mr. Wiggin
28w	Logging ..... (3 cred.; jr., sr.; prereq., 3-4)	II	TThS	302Hr	Mr. Cheyney
29f	Sawmill and Wood-Working Machin- ery ..... (3 cred.; jr., sr.; prereq., 3-4)	IV	MWF	302Hr	Mr. Cheyney
30s	Wood-Seasoning ..... (3 cred.; jr., sr.; prereq., 33-34)	III	MWF	302Hr	Mr. Cheyney
32w	Lumber Distribution..... (5 cred.; jr., sr.; prereq., 33 parallel)	I	MTWThF	302Hr	Mr. Cheyney
33f-34w	Wood Structure and Identification... (6 cred.; jr., sr.; prereq., 3-4, Bot. 4-5-6)	VI, VII, VIII	TTh	303Hr	Mr. Wentling
35w	Seeding and Planting..... (3 cred.; jr., sr.; prereq., 3-4)	III	MWF	301Hr	Mr. Wiggin
36w	Forest Policy and Administration... (5 cred.; sr.; prereq., 11, 43, 28 paral- lel)	IV	MTWThF	301Hr	Mr. Allison
39f	Wood Preservation..... (3 cred.; jr., sr.; prereq., 33 parallel)	III	TThS	301Hr	Mr. Allison
41f	Sylvics ..... (3 cred.; jr., sr.; prereq., 3-4, Bot. 4-5-6)	II	MWF	301Hr	Mr. Wentling
43s	Silviculture Laboratory..... (5 cred.; jr., sr.; prereq., 35)	Offered at Itasca Park			Mr. Wentling
44s	Wood Pulp and Paper..... (3 cred.; jr., sr.; prereq., 33-34, Chem. 3 or 10)	II	MWF	301Hr	Mr. Allison
46s	Forest Regulation Laboratory..... (5 cred.; jr., sr.; prereq., 11)	Offered at Itasca Park			Mr. Allison

†† Arrangements for this course must be made in advance.

‡ Offered only during the Summer Session at Itasca Park.

§ In the fall quarter this course follows hygiene lectures the last six weeks of the quarter. In the winter quarter it will be given the first six weeks of the quarter.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
47f-48w	Forest Products..... (6 cred.; soph., jr., sr.; no prereq.)	II	TThS	301Hr(f) (w)	Mr. Wentling, Mr. Allison
101w	Advanced Dendrology..... (3 cred.; jr., sr.; prereq., 3-4, Bot. 4-5-6)	Ar	Ar	Ar	Mr. Wentling
106w	Investigative Methods in Forestry... (3 cred.; sr.; prereq., 43)	II	MWF	301Hr	Mr. Hansen
107f	Uses of Wood I..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Mr. Wentling
108w	Uses of Wood II..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Mr. Wentling
109s	Uses of Wood III..... (3 cred.; sr.; prereq., 107, 108)	VI, VII, VIII	WF	303Hr	Mr. Wentling
110w	Mechanical and Physical Properties of Wood..... (2 cred.; sr.; prereq., 33-34)	III, IV	TS	303Hr	Mr. Wentling
112w	Advanced Forest Mensuration..... (3 cred.; sr.; prereq., 10)	Ar	Ar	Ar	Mr. Hansen
113w	Advanced Forest By-Products..... (3 cred.; sr.; prereq., 33-34, Chem. 35-36 or Agr. Biochem. 3)	Ar	Ar	Ar	Mr. Allison
119f	Advanced Wood Structures I..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	WF	303Hr	Mr. Wentling
120w	Advanced Wood Structures II..... (3 cred.; sr.; prereq., 119)	V, VII, VIII	WF	303Hr	Mr. Wentling

## FRESHMAN LECTURES

No.	Title	Hour	Day	Bldg.	Instructor
1f	Agriculture and Forestry..... (No cred.; required of all freshmen in Agr. and For.)	III	Th	107En	Mr. Freeman
2f	Home Economics..... (No cred.; required of all freshmen in H. E.)	III	Th	203HFE	Mr. Freeman

## GEOLOGY AND MINERALOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Geology..... (10 cred.†; soph., jr., sr.; prereq., chemistry)				
	Sec. 1	I	TWThFS	210P	Mr. Thiel
	2	III	MTThFS	110P	Mr. Emmons
	3	VII	MTWThF	110P	Mr. Allison
1w-2s*	General Geology..... (Same as 1f-2w)	II	MWThFS	210P	Mr. Werner
1s-2w*	General Geology..... (Same as 1f-2w)	III	MTThFS	110P	Mr. Emmons
7f-8w*	General Geology Laboratory..... (2 cred.†; soph., jr., sr.; supports 1-2)	Ar	Ar	112P	Mr. Allison

\* Offered on the Minneapolis campus.

† Both quarters must be completed before credit will be given.



No.	Title	Hour	Day	Bldg.	Instructor
7w-8s*	General Geology Laboratory..... (Same as 7f-8w)	Ar	Ar	112P	Mr. Allison
7s*	General Geology Laboratory..... (Same as 7f-8w)	Ar	Ar	112P	Mr. Allison
11f-12w*	Introduction to Geology..... (8 cred.†; soph., jr., sr.; no prereq.)	VIII	MTWThF	200aP	Mr. Werner
21w-22s*	Essentials of Mineralogy..... (6 cred.†; soph., jr., sr.; prereq., chemistry)				
	Lect.	IV	MWF	210P	Mr. Gruner
	Sec. 1 Lab.	VII, VIII, IX	F	100P	Mr. Gruner
	2	III	MWF	100P	Mr. Gruner
29f*	General Physiography..... (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	210P	
34w*	Meteorology .....	III	MTThFS	210P	
	(5 cred.; soph., jr., sr.; no prereq.)				
37s*	Economic and Commercial Geography (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	210P	
51f-52w*	Economic Geology..... (6 cred.†; jr., sr.; prereq., 1-2)	II	MWF	210P	Mr. Schwartz

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## GERMAN

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Beginning A..... (5 cred.; no prereq.)				
	Sec. 1	I	TWThFS	207F	Ar
	2	III	MTThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
1w*	Beginning A..... (Same as 1f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	207F	Ar
1s*	Beginning A..... (Same as 1f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VI	MTWThF	209F	Ar
2f*	Beginning B..... (5 cred.; prereq., 1 or 1 yr. h. s.)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VII	MTWThF	209½F	Ar
2w*	Beginning B..... (Same as 2f)				
	Sec. 1	I	TWThFS	207F	Ar
	2	III	MTThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
2s*	Beginning B..... (Same as 2f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	207F	Ar

\* Offered on the Minneapolis campus.

† Both quarters must be completed before credit will be given.

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No.	Title	Hour	Day	Bldg.	Instructor
3f*	Beginning C..... (5 cred.; prereq., 2) Sec. 1 2	III VII	MTThFS MTWThF	209F 209F	Ar Ar
3w*	Beginning C..... (Same as 3f) Sec. 1 2	II VI	MWThFS MTWThF	212F 209½F	Ar Ar
3s*	Beginning C..... (Same as 3f) Sec. 1 2 3 4	I III IV VI	TWThFS MTThFS MTWFS MTWThF	207F 207F 207F 207F	Ar Ar Ar Ar
10f*	Rapid Reading..... (5 cred.; prereq., 3 or 2 yrs. h. s.) Sec. 1 2 3	II IV VI	MWThFS MTWFS MTWThF	209F 209½F 209F	Ar Ar Ar
10w*	Rapid Reading..... (Same as 10f) Sec. 1 2	III VII	MTThFS MTWThF	209F 209F	Ar Ar
10s*	Rapid Reading..... (Same as 10f) Sec. 1 2	II VII	MWThFS MTWThF	212F 209½F	Ar Ar
11f*	Advanced Rapid Reading..... (5 cred.; prereq., 10 or 3 yrs. h. s.)	II	MWThFS	209½F	Ar
11w*	Advanced Rapid Reading..... (Same as 11f) Sec. 1 2	II VI	MWThFS MTWThF	209F 209F	Ar Ar
11s*	Advanced Rapid Reading..... (Same as 11f)	III	MTThFS	209F	Ar
28w-29s*	Chemical German..... (6 cred.‡; prereq., 15)	I	TThS	209F	Ar
31f-32w*	Medical German..... (6 cred.‡; prereq., 10 or 15)	I	MWF	209F	Ar
31w-32s*	Medical German..... (Same as 31f-32w) Sec. 1 2	I I	MWF TThS	209½F 209½F	Ar Ar
31s*	Medical German..... (5 cred.; prereq., same as 31f-32w)	I	MWF	209F	Ar
32f*	Medical German..... (5 cred.; prereq., 31)	I	MWF	209½F	Ar
50f-51w-52s*	Composition ..... (3 cred.‡; jr., sr.; prereq., 11, 14 or 4 yrs. h. s.)	IV	TS	209F	Mr. Jente

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
62s*	Nineteenth-Century Prose..... (5 cred.; prereq., 11 or 4 yrs. h. s.)	II	MWThFS	209½F	Ar
63f*	Modern Drama..... (3 cred.; jr., sr.; prereq., 11)	IV	MWF	209F	Mr. Downs
64w*	Classic Drama..... (3 cred.; jr., sr.; prereq., 62 or 63)	IV	MWF	209F	Mr. Downs
77s*	Goethe's Faust I..... (3 cred.; jr., sr.; prereq., 6 cred. above 60)	IV	MWF	209F	Mr. Schlenker

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## HISTORY AND PHILOSOPHY OF EDUCATION

### COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Brief Course in the History of Education ..... (5 cred.; jr., sr.; prereq., 6 cred. in psychol.)				
	Sec. 1	I	MTWThF	102Ed	Miss Alexander
	2	II	MTWThF	205Ed	Miss Alexander
	3	IV	MTWFS	205Ed	Miss Alexander
1w,s*	Brief Course in the History of Education ..... (See 1f)	II	MTWThF	205Ed	Miss Alexander
3f*	Educational Sociology..... (3 cred.; jr., sr.; prereq., 6 cred. in psychol.)				
	Sec. 1	II	MWF	205Ed	Mr. Finney
	2	III	MWF	205Ed	Mr. Finney
3w,s*	Educational Sociology..... (See 3f)	III	MWF	205Ed	Mr. Finney
5s	Public Education in the United States (3 cred.; jr., sr.; prereq., 6 cred. in psychol.)	VII	MWF	317Ad	Miss Alexander
101f-102w-103s*	Historical Foundations of Modern Education ..... (9 cred.; jr., sr.; prereq., Psychol. 6 cred., Hist. 6 cred.)	VIII	MWF	205Ed	Mr. Swift

For additional courses see the bulletin of the College of Education.

### HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s	Textiles ..... (5 cred.; no prereq.)				
	Sec. 1	I, II	MTWThF	211,307HE	Miss Weller, Miss Phelps
	(Sections limited to 20 students each)	2	III, IV	MTWFS	211,307HE
					Miss Weller, Miss Phelps

\* Offered on the Minneapolis campus.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s	Textiles (S. L. and A.)..... (3 cred.; no prereq.; not open to students in H.E.) (Limited to 20)	VI, VII	MWF	211,307HE	Miss Phelps
11f,w,s	Garment-Making ..... (3 cred.; no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss McDowell, Miss Ebersole
	(Limited to 20 each) 2	I, II	TThS	304HE	Miss McDowell, Miss Ebersole
	3	VI, VII, VIII	TTh	304HE	Miss McDowell, Miss Ebersole
13f,s	Dressmaking ..... (5 cred.; soph., jr., sr.; prereq., 3, 11, 51, home pract. in garment-making)				
	Sec. 1	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
	(Limited to 20 each) 2	I, II	TWThFS	305HE(f) 114HE(s)	Miss McDowell, Miss Patchin
13w	Dressmaking ..... (Same as 13f,s) (Limited to 20)	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
15w-16s	Advanced Clothing Construction.... (3 cred.; prereq., 13, 53; open only to teachers)	III, IV	S	305HE	Miss Patchin, Miss Carlotta Brown
17f,w†	Advanced Clothing Construction.... (3 cred.; sr.; prereq., 13, 53) (Limited to 20)	III, IV	MWF	305HE	Miss McDowell, Miss Patchin, Miss Carlotta Brown
17s	Advanced Clothing Construction.... (Same as 17f,w)				
	Sec. 1	III, IV	MWF	305HE	
	2	I, II	TThS	305HE	Miss McDowell, Miss Patchin, Miss Carlotta Brown
18w,s	Commercial Clothing Manufacture... (4 cred.; sr.; prereq., 17 or parallel)	VI, VII, VIII, IX	MWF	305HE	Miss Patchin
21f,w	Foods and Cookery..... (5 cred.; soph., jr., sr.; prereq., Chem. 10 cred., Physiol. 4 parallel)				
	Sec. 1	VI, VII	MTWThF	209HE	Miss Child
	(Limited to 20) 2	III, IV	MTWFS	209HE	Miss Child
21s	Foods and Cookery..... (Same as 21f,w) (Limited to 20)	VI, VII	MTWFS	209HE	Miss Child
22f	Food Economics..... (5 cred.; soph., jr., sr.; prereq., 21) (Limited to 20)	III, IV	MTWFS	205,207HE	Miss Child
22w,s	Food Economics..... (Same as 22f)				
	Sec. 1	III, IV	MTWFS	205,207HE	Miss Child
	(Limited to 20 each) 2	VI, VII	MTWThF	104,105,106HE	Ar

† Offered also in the Summer Session.

No.	Title	Hour	Day	Bldg.	Instructor
23f	Nutrition I..... (5 cred.; jr., sr.; prereq., 22, Agr. Biochem. 3, Bact. 1)				
	Sec. 1	I, II	MTWThF	211,213	HE Miss Anderson
	(Limited to 25)	2	VI, VII, VIII IX	MWF	211,213HE Miss Anderson
23w	Nutrition I..... (Same as 23f) (Limited to 25)	VI, VII, VIII, IX	MWF	211,213	HE Miss Anderson
24s	Camp Cookery..... (4 cred.; no prereq.; not open to stu- dents in H.E.)	Not offered in 1922-23			
25s	The Preparation of Food..... (3 cred.; dental nurses; prereq., Ele- mentary Chemistry)	VI, VII	MWF	103	HE Miss Child
34f,w,s†	Home Management: Operation and Maintenance, Lectures..... (3 cred.; jr.†, sr.; prereq., 22, 35 parallel, Econ. 5 or parallel)	VIII	MWF	203	HE Miss Studley
35f,w,s†	Home Management: Operation and Maintenance, Laboratory..... (6 cred.; jr.†, sr.; prereq., 22, 37 and H.E. Educ. 40 or parallel. 34 parallel, home practice in foods and cookery advised)	Ar	Ar	Ar	Miss Lindquist, Miss Studley
37f,s†	Health Care of the Family..... (3 cred.; jr., sr.; prereq., Chem. 5 cred., Bact. 1)				
	Lect.	I	S	213	HE Miss Moor- head
	(Lab. sections limited Sec. 1 Lab.	VI, VII	TTh	WH	Miss Fisher
	to 30)	2	VI, VII	MF	WH Miss Fisher
38w	First Aid..... (1 cred.; Phys. Educ. students; pre- req., An. Biol. 9)	II, III	F	WH	Miss Fisher
44s	Methods in Home Economics Exten- sion Work..... (3 cred.; sr.; prereq., H.E. Educ. 42)	IV	MWF	309	HE Miss Newton
45w,s	Home Economics Survey..... (2 cred.; sr.; no prereq.)	IV	TS	203	HE
51f,w,s	Drawing and Design..... (3 cred.; no prereq.)				
	Sec. 1	I, II	MWF	401	HE Miss Bacon, Miss V. Goldstein
	(Limited to 20 each)	2	I, II	TThS	401HE Miss Bacon, Miss V. Goldstein
	3	VI, VII, VIII	TTh	402	HE Miss Bacon, Miss V. Goldstein

† Offered also in the Summer Session.

‡ Open to juniors only in their third quarter.

No.	Title	Hour	Day	Bldg.	Instructor
52f,s	Art History and Appreciation..... (3 cred.; jr., sr.; prereq., 51) Sec. 1	II	MWF	309HE	Miss V. Goldstein
	2	VIII	MWF	309HE	Miss V. Goldstein
52w	Art History and Appreciation..... (Same as 52f,s)	VIII	MWF	309HE	Miss H. Goldstein
53f,s	Advanced Design..... (4 cred.; jr., sr.; prereq., 51) Sec. 1	VI,VII,VIII	MWF	402HE	Miss H. Goldstein, Miss V. Goldstein
	(Limited to 20 each) 2	I, II	MWThF	402HE	Miss H. Goldstein, Miss V. Goldstein
53w	Advanced Design..... (Same as 53f,s) (Limited to 20)	I, II	MWThF	402HE	Miss H. Goldstein, Miss Patchin, Miss V. Goldstein
54s	Interior Design..... (3 cred.; sr.; prereq., 52, 53, 131)	VI, VII	MWF	401HE	Miss Morse
55f,s	Decorative Needlework and Other Crafts ..... (3 cred.; jr., sr.; prereq., 51, 53 or parallel) (Limited to 12)	VI, VII, VIII	TTh	401HE	Miss Morse
57w	Weaving and Other Crafts..... (3 cred.; jr., sr.; prereq., 3, 51, 53) (Limited to 12)	VI, VII, VIII	TTh	401HE	Miss Morse
58w	Costume Design..... (3 cred.; jr., sr.; prereq., 55)	VI, VII	MWF	402HE	Miss H. Goldstein
61f,w,s	Large Quantity Cookery and Market- ing ..... (4 cred.; jr., sr.; prereq., 22)	Lect. I Lab. I, II, III	S TTh	309HE DH	Miss Richards Miss Richards
63f,w,s	Institution Experience..... (3 cred.; jr., sr.; prereq., 22)	Lect. II Lab. Arrange 6 hrs. of which 3 must be IV-hr. periods	S TTh	309HE	Miss Treat, Miss Richards
70w	Food Preparation in Relation to So- cial Work..... (3 cred.; soph.†, jr., sr.; prereq., An. Biol. 1-2, Chem. 10 cred. advised)	VI, VII	MWF	107HE	Miss Lindquist
71s	Elementary Dietetics for Social Work- ers ..... (3 cred.; soph.†, jr., sr.; prereq., 70, Physiol. 4 or parallel)	VI, VII	MWF	107HE	

† Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.



No.	Title	Hour	Day	Bldg.	Instructor
72f	Home Management Problems..... (3 cred.; soph.†, jr., sr.; prereq., 71, Econ. 5 or parallel)	VI	MWF	106HE	Miss Lindquist
103f,w,s	Dietetics ..... (5 cred.; sr.; prereq., 108) (Limited to 20)	VI, VII	MTWThF	203,207HE	Miss Biester
105f,w†	Experimental. Cookery..... (3 cred.; jr., sr.; prereq., 22, 23) (Limited to 12)	I, II	MWF	207HE	Miss Child
108f,w,s†	Nutrition II..... (5 cred.; jr., sr.; prereq., 23) (Limited to 25)	III, IV	MTWFS	211,213HE	Miss Anderson
109s	Advanced Nutrition..... (5 cred.; jr., sr.; prereq., 108, Agr. Biochem. 2)				
	Lect.	III	TS	106HE	Miss Biester, Miss Anderson
	(Limited to 15)	Lab.	VI, VII, VIII, IX	TTh 311HE	
110s	Special Problems in Dietetics..... (3 cred.; sr.; prereq., 103)				
	Lect.	VIII	MW	213HE	Miss Biester
	(Limited to 20)	Lab.	One full afternoon Ar		
111s†	Special Food Problems..... (3 cred.; sr.; prereq., 105, Agr. Bio- chem. 2)	VI,VII,VIII	TTh	107HE	Miss Child
122w,s	Advanced Textiles..... (3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 2, Econ. 5 or parallel) (Limited to 16)	VI, VII	MWF	307,311HE	Miss Phelps, Miss Weller
123w,s	Clothing Economics..... (2 cred.; jr., sr.; prereq., 13, Econ. 5)				
	Sec. 1	III	TTh	313HE	Miss Weller
	2	(for teachers) III, IV	S	313HE	Miss Weller
126s	Textile Analysis and Related Problems (3 cred.; jr., sr.; prereq., 122, Agr. Biochem. 2)	III, IV	MWF	311,313HE	Miss Weller, Miss Phelps
131f,w,s	Home Management: House-Planning and Equipment..... (5 cred.; sr.; prereq., 52, 53) (Limited to 20)	III, IV	MTWFS	401HE	Miss Morse
151s	Institution Management Problems.... (4 cred.; sr.; prereq., 61, 63)	IV III, IV	TS M	106HE 106HE	Miss Treat Miss Treat

## HOME ECONOMICS EDUCATION

## COLLEGE OF EDUCATION,

No.	Title	Hour	Day	Bldg.	Instructor
40f	Child-Training ..... (3 cred.; jr., sr.; prereq., H.E. 37, Psychol. 1-2)	IV	MWF	203HE	Miss Binzel

† Offered also in the Summer Session.

‡ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.

42f,w,†	Special Methods of Teaching Home Economics .....	VIII	MTWThF	313HE	Miss Miller, Miss Clara Brown
	(5 cred.; jr., sr.; prereq., H.E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. 45)				
43w	Organization and Methods for Related Art Teaching.....	IV	MWF	402HE	Miss H Goldstein
	(3 cred.; sr.; prereq., 42, H.E. 52, 53, 131)				
46f,w	Observation and Teaching: Related Art .....				
	(8 cred.; sr.; prereq., 42, H.E. 13, 52)				
	Lect.	IX	TTh	213HE	Miss Brown
	Teaching	Ar	Ar	Ar	Miss Bacon
47f,w	Observation and Teaching: Foods and Home Management.....				
	(8 cred.; sr.; prereq., 42, H.E. 34, 35)				
	Lect.	IX	TTh	213HE	Miss Miller
	Teaching	Ar	Ar	Ar	
48f,w	Observation and Teaching: Textiles and Clothing.....				
	(8 cred.; sr.; prereq., 42)				
	Lect.	IX	TTh	213HE	Miss Clara Brown,
	Teaching	Ar	Ar	Ar	Miss Ebersole, Miss Keever
49f,w	Observation and Teaching: General Home Economics.....				
	(8 cred.; sr.; prereq., 42)				
	Lect.	IX	TTh	213HE	Miss Miller, Miss Brown, Miss Keever
	Teaching	Ar	Ar	Ar	
141s†	Problems in Home Economics Education .....	VI	MWF	213HE	Miss Clara Brown
	(3 cred.; sr.; prereq., 42, Educ. Psychol.)				

## HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
6f	Fruit-Growing .....				
	(3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Alderman
	(Laboratory sections	IV	TS	102Hr	Mr. Alderman
	limited to 20)	I, II	T or F	8Hr	Mr. Alderman
	Sec. 1 Lab.	VII, VIII	M	8Hr	Mr. Alderman
	2	IV	MWF	210Hr	Mr. Brierley
21w	Small Fruit Culture.....				
	(3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.)				

† Offered also in the Summer Session.

No.	Title	Hour	Day	Bldg.	Instructor
32s	Vegetable-Growing ..... (3 cred.; no prereq.)	Sec. 1 Lect. II	MW	102Hr	Mr. Tapley, Mr. Bushnell
	(Laboratory section limited to 30)	2 IV Sec. 1 Lab. I, II 2 VII, VIII	TS T or F M	102Hr 8Hr 8Hr	
33w	Vegetable-Forcing ..... (3 cred.; soph., jr., sr.; prereq., 32, Bot. 9 cred.)	I VI, VII	TTh F	210Hr 8Hr	Mr. Tapley Mr. Tapley
50s	Floriculture ..... (3 cred.; no prereq.)	III	MWF	102Hr	Mr. Cady
56f	Propagation and Nursery Practice... (3 cred.; soph., jr., sr.; no prereq.)	I VI, VII	ThS T	102Hr 8aHr	Mr. Cady Mr. Cady
72f	Plant Materials ..... (3 cred.; no prereq.)	IV	MWF	102Hr	Mr. Cady
73s	History of Landscape Design..... (3 cred.; soph., jr., sr.; no prereq.)	II	TThS	102Hr	Mr. Cady
74w	Principles of Landscape Design..... (3 cred.; soph., jr., sr.; prereq., 72)	II	TThS	102Hr	
75f	Landscape Design I..... (3 cred.; jr., sr.; prereq., 74, Draw. 10 cred.)	VI, VII, VIII IX	TTh T	Ar	
76w	Landscape Design II..... (3 cred.; jr., sr.; prereq., 75)	VI, VII, VIII IX	TTh T	Ar	
81s	Advanced General Horticulture..... (3 cred.; jr., sr. in Agr. Educ.; pre- req., Bot. 9 cred.)	Ar	Ar	Ar	Mr. Alderman
93f	Judging Horticultural Crops..... (2 cred.; soph., jr., sr.; prereq., 6 or 32)	VI, VII, VIII	M	8aHr	Mr. Alderman
107f	Orchard Management..... (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	IV VI, VII	TS W	210Hr 8Hr	Mr. Brierley Mr. Brierley
109f	Principles of Genetics..... (3 cred.; jr., sr.; prereq., Bot. 9 cred., An. Biol. 9 cred.)	See Agronomy 131			
110w	Horticultural Crops-Breeding..... (3 cred.; jr., sr.; prereq., 109)	I	TThS	212Hr	Mr. Beaumont
111f	Systematic Pomology..... (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	II VI, VII	TTh Th	102Hr 8Hr	Mr. Brierley Mr. Brierley
131f	Advanced Vegetable Production..... (3 cred.; sr.; prereq., 32, Bot. 9 cred.)	III III, IV	TTh S	210Hr 8Hr	Mr. Tapley Mr. Tapley
132f	Systematic Olericulture..... (3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)	II VI, VII	TTh F	210Hr 8Hr	Mr. Tapley Mr. Tapley
133w	Commercial Truck-Growing..... (3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)	III	TThS	210Hr	Mr. Tapley
135w	Potato Production..... (3 cred.; jr., sr.; prereq., 6 or 32, Bot. 9 cred.)	III VI, VII	MW Th	102Hr 8Hr	Mr. Krantz Mr. Krantz
151f	Advanced Floriculture..... (3 cred.; jr., sr.; prereq., 50, Bot. 9 cred.)	Ar	Ar	Ar	Mr. Cady

No.	Title	Hour	Day	Bldg.	Instructor
191w-192s	Special Problems..... (6 cred.; jr., sr.; prereq., instructor's permission)	Ar	Ar	Ar	Mr. Alderman
193f-194w-195s	Horticultural Seminar..... (3 cred.; jr., sr.; prereq., 9 cred.)	Ar	Ar	Ar	Horticultural staff

## MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	First-Year Basic Course..... (No cred.; fr.; must be legally eligible for enrolment in R.O.T.C.)	VI	MWF	A	Ar
3s*	First-Year Basic Course..... (No cred.; fr.; prereq., 1-2)	VII, VIII, IX	W	A	Ar
4f-5w*	Second-Year Basic Course..... (No cred.; soph.; prereq., 1-2-3)	I III VIII	MWF MWF MWF	A A A	Ar Ar Ar
6s*	Second-Year Basic Course..... (No cred.; soph.; prereq., 4-5)	VII, VIII, IX	W	A	Ar
51f-52w*	First-Year Advanced Course..... (6 cred.; jr.; prereq., Second-Year Basic Course)	III VII, VIII, IX	TS Th	A A	Ar Ar
53s*	First-Year Advanced Course..... (3 cred.; jr.; prereq., 51-52)	III VII, VIII, IX	TS	A	Ar
54f-55w*	Second-Year Advanced Course..... (6 cred.; sr.; prereq., 51-52, 53)	IV VII, VIII, IX	T or W TS	A A	Ar Ar
56s*	Second-Year Advanced Course..... (3 cred.; sr.; prereq., 54-55)	IV VII, VIII, IX	Th T or W	A A	Ar Ar

## MUSIC

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	Harmony ..... (9 cred.‡; jr., sr.; no prereq.)	II VI	MWF MWF	Mu Mu	Ar Ar
10f-11w-12s*	Organ ..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Mr. Fairclough
16f-17w-18s*	First-Year Piano..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Ar
22f-23w-24s*	Violin ..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Ar
28f-29w-30s*	Voice ..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Miss Hull
40f-41w-42s*	Orchestra ..... (3 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Ar	Mr. Pepinsky
43f-44w-45s*	Choir ..... (3 cred.; jr., sr.; no prereq.)	IX	M	Mu	Mr. Scott
46f-47w-48s*	Appreciation of Music..... (3 cred.‡; jr., sr.; no prereq.)	VI	M	Mu	Miss Reeves

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

## PHYSICAL EDUCATION

## FOR MEN

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s*	Personal Hygiene..... (No cred.; required of all freshmen; no prereq.) Sec. 1	II	TTh	A	Dr. Cooke, Mr. Roemer Mr. Glidden
	2	III	TTh	A	Dr. Cooke, Mr. Roemer Mr. Glidden
	3	IV	TS	A	Dr. Brown, Mr. Roemer Mr. Glidden
	4	VII	TTh	A	Dr. Brown, Mr. Roemer Mr. Glidden
	5	VIII	TTh	A	Mr. Foster, Mr. Roemer Mr. Glidden
2f-3w-4s*	Gymnasium ..... (No cred.; no prereq.)	Same schedule as Course 1, Hygiene			
5f-6w-7s*	Advanced Leaders..... (3 cred.†; soph., jr., sr.; prereq., instr. permission)	Ar	TThS	A	Mr. Foster, Mr. Roemer
8f-9w-10s*	Corrective Gymnastics..... (No cred.; no prereq.)	Ar	Ar	A	Dr. Brown
11w-12s*	Wrestling ..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Gilman
13f-14w-15s*	Intermediate Swimming..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Glidden
16f-17w-18s*	Advanced Swimming..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Foster, Mr. Glidden
19w-20s*	Boxing ..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Goldie
21f-22w-23s*	Intramural Athletics..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Whittemore

## PHYSICAL EDUCATION

## FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*†	Elementary Physical Training..... (No cred.; required of all new students)	IV VI VII VIII III	MWF MWF MWF MWF TThS	3,151,153WGm 3,151,153WGm 3,151,153WGm 3,151,153WGm 3,151,153WGm	Ar Ar Ar Ar Ar
4f*	Preliminary Hygiene..... (No cred.; required of all new students)	I II IV VI III	M T T Th W	201WGm 201WGm 201WGm 201WGm 201WGm	Dr. Norris Dr. Norris Dr. Norris Dr. Norris Dr. Norris

\* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
7f-8w-9s*†	Sophomore Physical Training..... (No cred.; soph.; prereq., 1-2-3)	IV VI	TS TTh	3,153WGm 3,153WGm	
10f-11w-12s*§	Sophomore Orthopedic Gymnastics... (No cred.; soph.; prereq., 1-2-3)	IV VI	TS TTh	3,153WGm 3,153WGm	
13f-14w-15s*†	Sophomore Interpretive Dancing..... (No cred.; soph.; prereq., 1-2-3)	VIII IX	TTh TTh	151WGm 151WGm	Miss Baker Miss Baker
16f-17w-18s*§	Sophomore Organized Games and Folk Dancing ..... (No cred.; soph.; prereq., 1-2-3)	III	MF	151WGm	Ar
19f-20w-21s*§	Sophomore Major Sports..... (No cred.; soph.; prereq., 1-2-3)	IX	TTh	151WGm	Ar
22f-23w*	Sophomore Elementary Swimming... (No cred.; soph.; prereq., 1-2-3)	IV VII II III IV VII VIII	MW MW TTh WF TS TTh TTh	51WGm 51WGm 51WGm 51WGm 51WGm 51WGm 51WGm	Ar Ar Ar Ar Ar Ar Ar
28f-29w-28s*¶	Sophomore Advanced Swimming..... (No cred.; soph.; prereq., 1-2-3, swim- ming test)	VIII III	MW TTh	51WGm 51WGm	Ar Ar
32w*	Personal Hygiene..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 1-2)	III	TThS	201WGm	Ar
33s*	Hygiene of the Family..... (3 cred.; jr., sr.; prereq., An. Biol. 1-2)	II	MWF	201WGm	Dr. Norris
35w*	Intermediate Physical Training..... (1 cred.; jr., sr.; prereq., 6 qtrs.)	VII	TTh	153WGm	Ar
37f,w,s*	General Swimming..... (No cred.; no prereq.)	VIII, IX	MTThF	51WGm	No instr.
43f-44w-45s*	Folk Dancing and Organized Games (3 cred.‡; jr., sr.; prereq., 6 qtrs.)	VI	TThF	151WGm	Miss Kissock
46f-47w-48s*§	Hockey, Basket-Ball, Baseball..... (No cred.; fr., jr., sr.; prereq., per- mission of instr.)	IX	MW	151WGm	Ar
66f-67w-68s*	Interpretive Dancing..... (3 cred.‡; jr., sr.; prereq., 6 qtrs.)	III	MWF	151WGm	Miss Baker

For additional courses see the bulletin of the College of Education.

\* Offered on the Minneapolis campus.

† The third quarter is open to students who have not taken the preceding quarters.

‡ The full course must be completed before credit will be given.

§ The second or third quarter of this course is open to students who have not had the first two quarters.

¶ No students may register for more than two quarters of swimming without permission.



## PHYSICS

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Elements of Mechanics and Sound... (3 cred.; prereq., Trigonometry)				
	Lect.	VIII	MWF	30Ph	Mr. Erikson
	Quiz	IX	F	100C	Mr. Erikson
1s*	Elements of Mechanics and Sound.. (Same as 1f,w)				
	Lect.	III	TThS	30Ph	Mr. Erikson
	Quiz	IX	F	100C	Mr. Erikson
2f w,s*	Elements of Mechanics Laboratory.. (1 cred.; prereq., 1 or parallel)				
	Sec. 1	VI, VII	T	16Ph	Mr. Erikson
	2	VIII, IX	T	16Ph	Mr. Erikson
	3	VIII, IX	Th	30Ph	Mr. Erikson
9s*	Acoustics ..... (3 cred.; no prereq.)	Ar	Ar	30Ph	Mr. Erikson
21f*	Heat ..... (3 cred.; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Miller
	Quiz	IX	W	100C	Mr. Miller
22f*	Heat Laboratory..... (1 cred.; prereq., 2, 21 or parallel)				
	Sec. 1	VI, VII	M	23Ph	Mr. Miller
	2	VIII, IX	M	23Ph	Mr. Miller
	3	VI, VII	T	23Ph	Mr. Miller
	4	VIII, IX	T	23Ph	Mr. Miller
31f,s*	Optics ..... (3 cred.; prereq., 1)				
	Lect.	I	TThS	30Ph	Mr. Valasek
	Quiz	IX	M	100C	Mr. Valasek
32f,s*	Optics Laboratory..... (1 cred.; prereq., 2, 31 or parallel)				
	Sec. 1	VI, VII	Th	23Ph	Mr. Valasek
	2	VIII, IX	Th	23Ph	Mr. Valasek
	3	VI, VII	F	23Ph	Mr. Valasek
	4	VIII, IX	F	23Ph	Mr. Valasek
41w*	Magnetism and Electricity..... (3 cred.; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Zeleny
	Quiz	IX	W	100C	Mr. Zeleny
42w*	Electrical Laboratory..... (1 cred.; prereq., 2, 41 or parallel)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny
	2	VIII, IX	T	31Ph	Mr. Zeleny
	3	VI, VII	Th	31Ph	Mr. Zeleny
	4	VI, VII	W	31Ph	Mr. Zeleny

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Offered on the Minneapolis campus.

## PHYSIOLOGY

## MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s*†	Human Physiology..... (5 cred.; prereq., 1 qtr. an. biol., 1 qtr. chem.)				
	Lect.	III	Th and		
		IV	MWF	315MH	Dr. Beard and
	Lab.	II, III, IV	S		others
	Dem.	III, IV	T		
57w-58s*†	Human Physiology..... (4 cred.; jr., sr.; prereq., An. Biol. 1, 2 or 5, 6, 7; Chem. 1, 2, 3 or 4, 5)				
		I	TThS	301MH	Dr. Lyon,
	Lab. Div. A	II, III, IV	T		Dr. Gault,
	Lab. Div. B	V, VII, VIII	W		and others
59s*†	Physiologic Chemistry..... (4 cred.; jr., sr.; prereq., same as 57-58)				
		I	TThS	310MH	Dr. Pettibone
	Lab. Div. B	II, III, IV	T		and others
	Lab. Div. A	VI, VII, VIII	W		
100f-101w*†	Physiologic Chemistry..... (12 cred.; jr., sr.; prereq., an. biol., org. chem., physics)				
		IV	MWF	310MH	Dr. McClendon
	Lab. Div. A	I, II, III	TTh		Dr. Pettibone
	Lab. Div. B	I, II, III	FS		Dr. Kingsbury
103f*†	Physiology of Muscles, etc..... (8 cred.; jr., sr.; prereq., same as 100-101)	IV, VI, VII, VIII	MWF	301MH	Dr. Scott and others
104w*†	Physiology of Nervous System, etc.. (8 cred.; jr., sr.; prereq., same as 100-101)	IV, VI, VII, VIII	MWF	301MH	Dr. Lyon, Dr. Scott, and others

For additional courses see the bulletin of the Medical School.

## PLANT PATHOLOGY AND BOTANY

No.	Title	Hour	Day	Bldg.	Instructor
1f†	Plant Pathology..... (5 cred.; jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
7w-8s	Weeds and Grasses..... (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII	WF	3PP	Mr. Larson
9f†	Weeds and Seed-Testing..... (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII	WF	3,4PP	Mr. Larson
10f	Forest Pathology..... (5 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
12w	Seed Problems..... (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Mr. Larson

\* Offered on the Minneapolis campus.

† Offered also in the Summer Session.

No.	Title	Hour	Day	Bldg.	Instructor
14s	Plant Disease Control..... (5 cred.; jr., sr.; prereq., 1, Entom. 3)	Ar	Ar	Ar	Mr. Barker
105f-106w- 107s	Mycology ..... (9 cred.; jr., sr.; prereq., Bot. 7, 11 or equiv.)	III, IV	MWF	1,32PP	Miss Dossall
108f	Methods ..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 1)	I, II	MWF	1,2PP	Mr. Leach
110w	Principles of Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 1)	I, II	MWF	1,2PP	Mr. Stakman, Mr. Barker
111w†	Diseases of Ficid Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Stakman, Mr. Barker
112s‡	Diseases of Fruit Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	
113s‡	Diseases of Vegetable Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Leach
114w	Advanced Forest Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10)	VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach

### • POLITICAL SCIENCE

#### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	American Government..... (5 cred.; soph., jr., sr.; no prereq.)				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VII	MTWThF	306D	Ar
1w*	American Government..... (Same as 1f)				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VII	MTWThF	306D	Ar
1s*	American Government..... (Same as 1f)				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VII	MTWThF	LitTh	Ar
7f*	State Government..... (5 cred.; soph., jr., sr.; prereq., 1)	VI	MTWThF	306D	Mr. Cushman
7w*	State Government..... (Same as 7f)	VI	MTWThF	202MA	Mr. Cushman
7s*	State Government..... (Same as 7f)	VI	MTWThF	202MA	Mr. Cushman
51f-52w-53s*	Business Law..... (9 cred.; jr., sr.; prereq., Econ. 10 cred.)	II	MWF	109F	Mr. Young

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Poultry ..... (3 cred.; no prereq.)	VI	MWF	104Ve	Mr. Smith
2w	Poultry-Judging ..... (3 cred.; prereq., 1)	Ar	Ar	Ar	Mr. Smith

\* Offered on the Minneapolis campus

† Offered also in the Summer Session.

‡ Courses 112 and 113 will ordinarily alternate with each other. One but not both will be given in 1922-23.

No.	Title	Hour	Day	Bldg.	Instructor
43	Incubating and Brooding..... (3 cred.; no prereq.)	VI	MWF	104Ve	Mr. Smith
53	Advanced Poultry-Judging..... (3 cred.; prereq., 2)	Ar	Ar	Ar	Mr. Smith

## PSYCHOLOGY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Psychology..... (6 cred.‡; soph., jr., sr.; no prereq.)	Lect. I Rec. (one hour)	MW	MuAud	Mr. Elliott, Mr. Foster
		I Th or F or S	Psy		
		II Th or F or S	Psy		
		VII Th or F	Psy		
		VIII Th or F	Psy		
1w-2s*	General Psychology..... (Same as 1f-2w)	Sec. 1 V 2 VI 3 VII	MWF	PsyAmph	
1f-6w*	General Psychology for Business Students ..... (6 cred.‡; soph., jr., sr.; business and pre-business students; no prereq.)	Lect. III Rec. (one hour)	MW	MuAud	Mr. Elliott, Mr. Foster, Mr. Paterson
		III Th or F or S	Psy		
		IV F or S	Psy		
3s*	Psychology Applied to Daily Life.... (3 cred.; soph., jr., sr.; prereq., 1-2)	Lect. I Rec. (one hour)	MW	LitTh	Mr. Elliott, Mr. Foster, Mr. Paterson
		I Th or F or S	Psy		
		II Th or F or S	Psy		
4f-5w*	Introductory Laboratory Psychology. (4 cred.‡; soph., jr., sr.; prereq., 1-2 or parallel, or 1-6 by permission)	I, II	TTh	211Psy	Mr. Foster
	Sec. 1	III, IV	TS	211Psy	
	2	VI, VII	TTh	211Psy	
	3	VIII, IX	TTh	211Psy	
	4				
7s*	Introductory Laboratory Psychology. (Same as 4f-5w)	Sec. 1 VI, VII 2 III, IV	MTWF	211Psy	
			MTWF	211Psy	
9s*	Animal Behavior..... (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	III	MWF	109Psy	Mr. Lashley

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w*	Experimental Psychology..... (9 cred.§; jr., sr.; prereq., 1-2 or 4-5 or 7, or Physics, 8 cred.)	VII VIII	MWF WF	116Psy	Mr. Johnson
108w-109s*	Advanced General Psychology..... (6 cred.‡; sr.; prereq., 101-102)	VIII, IX IX	M W	109Psy 109Psy	Mr. Johnson
114w-115s*	Human Behavior..... (6 cred.‡; jr., sr.; prereq., 1-2 or 6, 4-5 or 7, or An. Biol. 1-2)	II	TThS	109Psy	Mr. Elliott
124f*	Psychology of Learning..... (3 cred.; jr., sr.; prereq., 1-2 or 6, 4-5 or 7)	IV	MWF	109Psy	Mr. Lashley
125f-126w*	Psychology of Individual Differences (6 cred.‡; jr., sr.; prereq., 1-2 or 6, 4-5 or 7 or Educ. Psychol. 126-127)	II	MWF	109Psy	Mr. Paterson

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Hour	Day	Bldg.	Instructor
10f-11w-12s	Agricultural Journalism..... (9 cred.; jr., sr.; prereq., 13-14-15, 16-17)	VI	MWF	217En	Mr. Kirkwood
19f	Agricultural Publicity..... (3 cred.; jr., sr.; prereq., Rhet. 19 cred. or Rhet. 9 cred., Eng. 9 cred.)	I	TThS	4PP	Mr. Kirkwood

### RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
1f	Rhetoric I..... (3 cred.; no prereq.)				
	Sec. 1	I	MWF	310En	Miss Clausen
	2	II	MWF	311En	Miss Tripp
	3	III	MWF	310En	Miss Tripp
	4	IV	MWF	310En	Miss Clausen
	5	II	TThS	310En	Miss Tripp
	6	I	TThS	311En	Miss Clausen
1w,s	Rhetoric I..... (Same as 1f)	VII	MWF	310En	Ar
2f	Rhetoric II..... (3 cred.; prereq., 1)	II	MWF	310En	Miss Clausen
2w	Rhetoric II..... (Same as 2f)				
	Sec. 1	II	MWF	310En	Miss Tripp
	2	IV	MWF	310En	Miss Clausen
	3	III	TThS	310En	Miss Tripp
	4	II	TThS	310En	Miss Clausen
	5	II	TThS	308En	Miss Tripp
	6	III	MWF	310En	Miss Clausen
2s	Rhetoric II..... (Same as 2f)	II	TThS	310En	Miss Clausen
3f	Rhetoric III..... (3 cred.; prereq., 2)	III	TThS	310En	Miss Tripp

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

§ Six credits will be allowed for the first two quarters.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
3w	Rhetoric III..... (Same as 3f)	III	MWF	307En	Miss Tripp
3s	Rhetoric III..... (Same as 3f)				
	Sec. 1	II	MWF	310En	Miss Clausen
	2	IV	MWF	310En	Miss Clausen
	3	IV	MWF	308En	Miss Tripp
	4	I	TThS	310En	Miss Clausen
	5	II	MWF	308En	Miss Tripp
	6	III	MWF	308En	Miss Tripp
4f,w,s	Elementary Rhetoric..... (3 cred.; no prereq.)	Ar	Ar	Ar	Miss Tripp
11f	Argumentation ..... (3 cred.; soph., jr., sr.; prereq., 3, 22 recommended)	I	MWThFS	307En	Mr. Lansing
11w	Argumentation ..... (Same as 11f)	III	MTWFS	311En	
11s	Argumentation ..... (Same as 11f)				
	Sec. 1	III	MTWFS	307En	Mr. Lansing
	2	IV	MTWFS	311En	Mr. Burtis
22f	Public Speaking..... (3 cred.; soph., jr., sr.; prereq., 3)				
	Sec. 1	II	MTWFS	311En	Mr. Burtis
	2	IV	MTWFS	311En	Mr. Burtis
22w	Public Speaking..... (Same as 22f)				
	Sec. 1	I	MTWFS	311En	Mr. Burtis
	2	IV	MTWFS	311En	Mr. Burtis
22s	Public Speaking..... (Same as 22f)	III	MTWFS	311En	Mr. Burtis
24f	Advanced Public Speaking..... (3 cred.; soph., jr., sr.; prereq., 22)	III	TThS	311En	Mr. Burtis
24w,s	Advanced Public Speaking..... (Same as 24f)	II	TThS	311En	Mr. Burtis
31f,w,s	Survey of English Literature I.... (5 cred.; soph., jr., sr.; prereq., 3)	II	MWThFS	307En	Mr. Lansing
32f,w,s	Survey of English Literature II.... (3 cred.; soph., jr., sr.; prereq., 3)	IV	MWF	307En	

## ROMANCE LANGUAGES

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

#### *French*

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	Beginning French..... (10 cred.; no prereq.)				
	Sec. 1	I	TWThFS	213F	Ar
	2	II	MWThFS	227F	Ar
	3	III	MTThFS	226F	Ar
	4	IV	MTWFS	201F	Ar
	5	VI	MTWThF	202F	Ar
	6	VII	MTWThF	226F	Ar
	7	VIII	MTWThF	202F	Ar

\* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given.



No.	Title	Hour	Day	Bldg.	Instructor
1w-2s*	Beginning French..... (Same as 1f-2w)				
	Sec. 1	I	TWThFS	227F	Ar
	2	VII	MTWThF	202F	Ar
1s*	Beginning French..... (5 cred.†; no prereq.)				
	Sec. 1	I	TWThFS	Ar	Ar
	2	VIII	MTWThF	Ar	Ar
2f*	Beginning French..... (5 cred.†; prereq., 1)				
	Sec. 1	I	TWThFS	202F	Ar
	2	VII	MTWThF	213F	Ar
3f-4w*	Intermediate French..... (10 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	I	TWThFS	205F	Ar
	2	II	MWThFS	204F	Ar
	3	III	MTThFS	213F	Ar
	4	VI	MTWThF	226F	Ar
	5	VIII	MTWThF	213F	Ar
3w-4s*	Intermediate French..... (Same as 3f-4w)				
	Sec. 1	I	TWThFS	202F	Ar
	2	VII	MTWThF	213F	Ar
3s*	Intermediate French..... (5 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	I	TWThFS	213F	Ar
	2	II	MWThFS	227F	Ar
	3	III	MTThFS	226F	Ar
	4	IV	MTWFS	201F	Ar
	5	VI	MTWThF	202F	Ar
	6	VII	MTWThF	226F	Ar
	7	VIII	MTWThF	202F	Ar
4f*	Intermediate French..... (5 cred.; prereq., 3)				
	Sec. 1	II	MWThFS	213F	Ar
	2	III	MTThFS	124F	Ar
	3	IV	MTWFS	125F	Ar
	4	VII	MTWThF	202F	Ar
2of*	Oral and Written French..... (5 cred.; prereq., 3-4 or 3 yrs. h. s.)				
	Sec. 1	III	MTThFS	205F	Mr. Frelin
	2	VIII	MTWThF	206F	Ar
2os*	Oral and Written French..... (Same as 2of)				
	Sec. 1	I	TWThFS	15F	Ar
	2	II	MWThFS	213F	Ar
	3	III	MTWFS	213F	Ar
	4	VII	MTWThF	213F	Ar
21f-22w-23s*	Survey of French Literature..... (9 cred.†; prereq., 3-4 or 3 yrs. h. s.)				
	Sec. 1	II	TThS	107F	Mr. LeCompte
	2	III	TThS	301F	Mr. van Roosbroeck
	3	VII	MWF	107F	Mr. Searles

\* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
50f-51w-52s*	French Conversation..... (3 cred.‡; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s., 53-54-55 or parallel)				
	Sec. 1	III	MW	201F	Miss Phelps
	2	VI	MW	107F	Mr. Frelin
53f-54w-55s*	French Composition..... (3 cred.‡; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s.)				
	Sec. 1	III	F	201F	Miss Phelps
	2	VI	F	107F	Mr. Frelin

*Spanish*

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	Beginning Spanish..... (10 cred.‡; no prereq.)				
	Sec. 1	I	TWThFS	15F	Ar
	2	II	MWThFS	226F	Ar
	3	III	MTThFS	227F	Ar
	4	IV	MTWFS	226F	Ar
	5	VI	MTWThF	201F	Ar
	6	VII	MTWThF	201F	Ar
	7	VIII	MTWThF	226F	Ar
1w-2s*	Beginning Spanish..... (Same as 1f-2w)				
	Sec. 1	II	TWThFS	202F	Ar
	2	III	MTThFS		
	3	VII	MTWThF	125F	Ar
1s*	Beginning Spanish..... (5 cred.‡; no prereq.)				
	Sec. 1	II	TWThFS	201F	Ar
	2	VII	MTWThF	201F	Ar
2f*	Beginning Spanish..... (5 cred.‡; prereq., 1)				
	Sec. 1	I	TWThFS	201F	Ar
	2	VIII	MTWThF	201F	Ar
3f-4w*	Intermediate Spanish..... (10 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	II	MWThFS	201F	Ar
	2	III	MTThFS	202F	Ar
	3	VI	MTWThF	227F	Ar
	4	VII	MTWThF	109F	Ar
3w-4s*	Intermediate Spanish..... (Same as 3f-4w)				
	Sec. 1	I	TWThFS	201F	Ar
	2	VIII	MTWThF	201F	Ar
3s*	Intermediate Spanish..... (5 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	I	TWThFS	226F	Ar
	2	II	MWThFS	226F	Ar
	3	III	MTThFS	227F	Ar
	4	IV	MTWFS	226F	Ar
	5	VI	MTWThF	201F	Ar
	6	VII	MTWThF	201F	Ar
	7	VIII	MTWThF	227F	Ar

\* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

† Open without petition to sophomores who can satisfy the prerequisites.

No.	Title	Hour	Day	Bldg.	Instructor
(3s)-4f*	Intermediate Spanish..... (Same as 3f-4w)				
	Sec. 1	I	TWThFS	301F	Ar
	2	II	MWThFS	202F	Ar
	3	III	MTThFS	308D	Ar
	4	IV	MTWFS	202F	Ar
	5	VI	MTWThF	227F	Ar
20s*	Oral and Written Spanish..... (5 cred.; prereq., 3-4 or 3 yrs. h. s.)	III	MTThFS	202F	Ar
50f-51w-52s*	Spanish Conversation..... (3 cred.†; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s., 53-54-55 or parallel)	II	MW	302D	Mr. Coburn
53f-54w-55s*	Spanish Composition..... (3 cred.†; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s.)	II	F	302D	Mr. Coburn
65f-66w-67s*	Survey of Spanish Literature..... (9 cred.†; jr.†, sr.; prereq., 3-4)	II	TThS	306F	Mr. Gillet

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## SOCIOLOGY AND SOCIAL WORK

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f	Introduction to Sociology..... (5 cred. except section 7; 3rd qtr. fr., soph., jr., sr.; no prereq.)				
	Sec. 1*	I	TWThFS	9F	
	2*	III	MTThFS	5F	
	3*	IV	MTWFS	9F	
	4, 5*	VI	MTWThF	9F	
	6*	VII	MTWThF	5F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
1w	Introduction to Sociology..... (Same as 1f)				
	Sec. 1*	I	TWThFS	9F	
	2*	III	MTThFS	5F	
	3*	IV	MTWFS	9F	
	4, 5*	VI	MTWThF	9F	
	6*	VII	MTWThF	5F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
	8*	VIII	MTWThF	9F	
1s	Introduction to Sociology..... (Same as 1f)				
	Sec. 1*	I	TWThFS	9F	
	2*	II	MWThFS	5F	
	3*	III	MTThFS	9F	
	4*	IV	MTWFS	9F	
	5, 6*	VI	MTWThF	9F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
	8*	VII	MTWThF	5F	
	9*	VIII	MTWThF	9F	

\* Offered on the Minneapolis campus.

† Open without petition to sophomores who can satisfy the requirements.

‡ The full course must be completed before credit will be given.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
3t,w,s*	Educational Sociology..... (See Hist. and Philos. of Educ.)				
6f,w,s*	Modern Social Reform Movements.. (3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	II	TThS	9F	Ar
	2	IV	MWF	5F	Ar
	3	VI	MWF	6F	Ar
14f,w	Rural Sociology..... (3 cred.; soph., jr., sr.; prereq., 1 or sr. class)				
	Sec. 1*	III	MWF	9F	Mr. Hoffer
	2*	VI	MWF	25F	Mr. Lantis
	3	I	MWF	105En	Mr. Lundquist
14s*	Rural Sociology..... (Same as 14f,w)				
	Sec. 1	III	MWF	25F	Ar
	2	VI	MWF	15F	Ar
51f,w,s*	The Occurrence of the Socially In- adequate ..... (3 cred.; jr., sr.; prereq., 10 cred. in sociol., or 10 in sociol. and pol. sci., econ., or psychol.)	I	MWF	5F	Mr. Bruno
52f,w,s*	Elementary Case Work..... (3 cred.; jr., sr.; prereq., 51)	I	TThS	5F	Mr. Bruno
53f,w,s*	Elements of Criminology..... (Same as 51)	III	MWF	9F	Mr. Elmer
55w*	Housing Problems..... (Same as 51)	I	MWF	25F	Mr. Davis
60w*	Child Welfare..... (3 cred.; jr., sr.; prereq., 51, 52)	IX	MWF	9F	Mr. Hodson
101w*	Social Organization..... (3 cred.; jr., sr.; prereq., 4 courses in sociol., or Sociol. 1 and 15 cred. in sociol., anthropol., econ., educ., hist., philos., pol. sci., or psychol.)	II	TThS	9F	Mr. Bernard
102s*	Social Control..... (3 cred.; jr., sr.; prereq., same as 101)	II	TThS	9F	Mr. Bernard
110w*	Community Organization and Social Work in Small Towns and Coun- try ..... (2 cred.; jr., sr.; prereq., same as 101)	VIII, IX	Th	9F	Mr. Bernard
114s	Rural Social Institutions..... (3 cred.; jr., sr.; prereq., same as 101)	I	MWF	105En	Mr. Lundquist
119f*	The Family..... (3 cred.; jr., sr.; prereq., same as 101)	III	TThS	9F	Mr. Elmer
120f*	Social Progress..... (3 cred.; jr., sr.; prereq., same as 101)	II	MWF	9F	
122w*	Methods of Social Investigation.... (3 cred.; jr., sr.; prereq., same as 101)	VIII	MWF	5F	Mr. Elmer

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No.	Title	Hour	Day	Bldg.	Instructor
123s*	Social Statistics.....	VIII	MWF	5F	Mr. Elmer
	(3 cred.; jr., sr.; prereq., 122)				
128s*	Charitable Administration, Finance, and Publicity.....	VIII, IX	Th	5F	Mr. Davis
	(2 cred.; jr., sr.; prereq., same as 101)				
134s*	Legal Protection of the Child.....	IX	MWF	5F	Mr. Hodson
	(3 cred.; jr., sr.; prereq., same as 101, incl. 60)				
140w*	History of Social Theory.....	II	MWF	9F	Mr. Bernard
	(3 cred.; jr., sr.; prereq., same as 101)				
141s*	Contemporary Social Theory.....	II	MWF	9F	Mr. Bernard
	(3 cred.; jr., sr.; prereq., same as 101)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### SOILS

No.	Title	Hour	Day	Bldg.	Instructor
4f	Soils .....				
	(3 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	III	TTh	251Ch	Mr. Rost
	Lab.	III, IV	S	253Ch	
5s	Soil Fertility.....				
	(3 cred.; soph., jr., sr.; prereq., 4)				
	Lect.	III	TTh	251Ch	Mr. Alway,
	Lab.	III, IV	S	253Ch	Mr. Rost
101f	Chemical Analysis of Soils.....	Ar	Ar	Ar	Mr. Rost
	(3 to 5 cred.; jr., sr.; prereq., 5, Quant. Anal.)				
102w,s	Special Problems in Soils.....	Ar	Ar	Ar	Mr. Alway
	(Cred. assigned according to amount of work; jr., sr.; prereq., 101 or 108)				
104s	Soil-Surveying .....	Ar	Ar	Ar	Mr. McMiller
	(3 cred.; jr., sr.; prereq., 108)				
105w	Minnesota Soils.....	Ar	Ar	Ar	Mr. Alway
	(3 cred.; jr., sr.; prereq., 5)				
107w	Fertilizers and Manures.....	IV	TS	Ar	Mr. Rost
	(2 cred.; jr., sr.; prereq., 5)				
108w	Physical Properties of Soils.....	Ar	Ar	Ar	Mr. McMiller
	(3 cred.; jr., sr.; prereq., 5)				

### VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
2f	Anatomy of Domestic Animals.....	II	MTThS	2Ve	Mr. Kernkamp
	(5 cred.; soph., jr., sr.; no prereq.)	VI	T	2Ve	
3w-4s	Comparative Physiology.....	I	TThS	2Ve	Mr. Hewitt
	(6 cred.; soph., jr., sr.; prereq., 2)				
6f	Physiology and Hygiene of Breeding	IV	MWF	9Ve	Mr. Boyd
	(3 cred.; jr., sr.; prereq., 3-4)				

\* Offered on the Minneapolis campus.

# PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
8s	Veterinary Studies.....	III	MTWFS	9Ve	Mr. Reynolds
	(5 cred.; soph., jr., sr.; no prereq.)				
12W	Infectious Diseases.....	I	MWF	2Ve	Mr. Fitch, Mr. Billings
	(3 cred.; jr., sr.; prereq., 3-4, Bact. 1)				
13S	Non-Infectious Diseases.....	I	MWF	2Ve	Mr. Boyd
	(3 cred.; jr., sr.; prereq., 3-4)				
101W-102S	Advanced Anatomy of Domestic Ani- mals .....	Ar	Ar	Ar	Mr. Kernkamp
	(6 cred.; jr., sr.; prereq., 2 or equiv.) (Limited to 9)				
103f-104W	Advanced Comparative Physiology...				
	(6 cred.; jr., sr.; prereq., 3-4 or equiv.)				
	Lect.	II	TTh	9Ve	Mr. Hewitt
	Lab.	VI, VII	Th	9Ve	Mr. Hewitt

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